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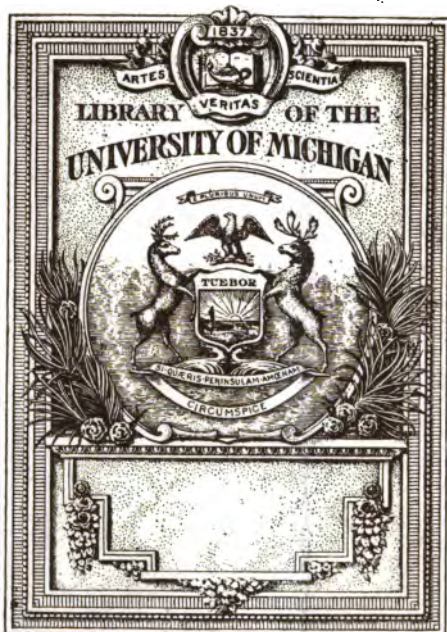
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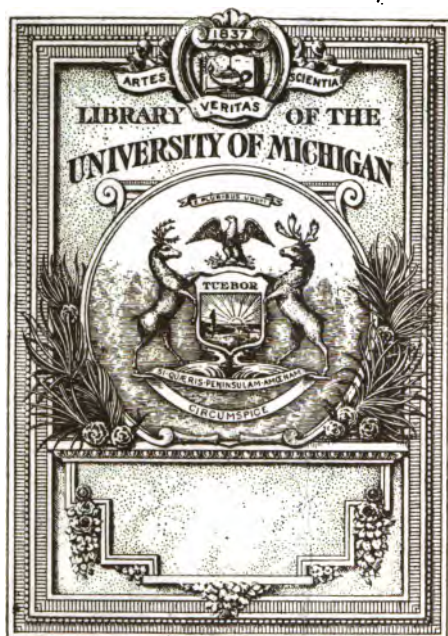
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PREFACE

SQUIBB'S ATLAS OF THE OFFICIAL DRUGS is a complete, up-to-date, trustworthy handbook on pharmacognosy.

Pharmacognosy in its broadest signification is a knowledge of drugs, whether healing or noxious. It has been made to include all remedies, not only those in a natural state but also those changed by art. This latter inclusive meaning is designated more correctly by pharmacology, and the best present-day usage limits pharmacognosy to one branch of pharmacology, namely, *a knowledge of crude drugs*.

The importance of a knowledge of crude drugs (pharmacognosy) to the physician, and especially to the pharmacist, cannot be overestimated. It is true that the day when the physician gathered or bought roots and leaves, and himself prepared his remedies from them, has gone. He now has at hand elegant preparations made in large laboratories. In this, however, may be a danger. Too often the pharmacist allows low price rather than quality to appeal to him, and too often the physician is content to use without question what is offered by the manufacturer. A knowledge of the nature and of the therapeutic value of the crude drugs used as the basis for the remedies in question would have dispelled an illusion financially detrimental and injurious to reputation. It has been urged, however, and with some degree of truth, that, without an unwarranted expenditure of time, a working knowledge of pharmacognosy cannot be had,

as it must be sought out from much which is of use to the specialist only.

To provide pharmacists and physicians and students of pharmacy and of medicine with a handbook on pharmacognosy, one which should be complete, yet at the same time clear, concise and with its matter in a form easy to get at and to use, has been our object in publishing this Atlas.

Squibb's Atlas of The Official Drugs, then, has the following characteristics:

1. It is complete but does not burden the user with matter of no interest to him. It confines itself to the living materia medica, to the standardized drugs of the United States Pharmacopœia and of the National Formulary; so all that is mentioned in Squibb's Atlas is of worth.

2. It classifies and groups the drugs so as to permit ready reference.

3. It systematizes all descriptions, so that the information contained therein is easily remembered.

4. It provides a working photograph of each drug, so that by the eye the description is made clearer and easily comprehended, while there is gained information which no verbal description could convey.

5. The introduction to each chapter contains an explanation of the terms used in describing each class of drugs.

6. A glossary of botanical terms is added, giving direct information to the student and affording the professional man an opportunity to refresh his memory.

The author is convinced by years of practical work and teaching that the most logical method of classifying drugs is by separating them into groups according to the part or parts used, i.e., roots, barks, etc. Such a classification enables the student and phar-

macist more easily to recognize and memorize the diagnostic characteristics of each drug.

Under each drug are given its title, abbreviation, English name, synonyms, botanical origin, part or parts used, permissible limits of impurities, assay, habitat, description (including odor and taste), and official preparations, if any.

The descriptions of the drugs of a group have been systematized so that they all begin and end in the same sequence. Each description is complete, yet free from unnecessary technical terms, and care has been taken to include such new facts as are indispensable to the selection of pure drugs.

All the photographs are made from original material selected and arranged by the author. In the case of starch, lycopodium, etc., the plates are made from drawings by the author. In preparing the plates care has been taken to have every part of the description illustrated, so that the reader has a pictorial as well as a written description of each official drug. In selecting and arranging the material preparatory to photographing, it frequently has been necessary to examine hundreds of samples and tons of drugs in order to make the photographs typical and at the same time to show the normal variation in form. In most cases separate photographs and descriptions are given of each drug, even though in some instances the United States Pharmacopœia and the National Formulary group these drugs under one title.

The introduction to each chapter sets forth the plan of study of each group and includes illustrations of the terms used in describing the individual drugs of that chapter.

In a work on pharmacognosy the use of technical terms is unavoidable, but the introductions to the

chapters will sufficiently explain their meaning and obviate any difficulties in this respect, while the glossary will give further help in understanding the terms used.

The author is indebted to Messrs. E. R. Squibb & Sons for their generosity in the matter of illustrations and general execution of the book, inasmuch as they have provided the very best products of the photographers' and engravers' arts.

It is hoped that Squibb's Atlas, for the preparation of which years of work have been required, will stimulate the interest of both pharmacists and physicians in the nature and genuineness of the drugs they use, and will awaken the members of each of these professions to the necessity for using only genuine drugs.

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CONTENTS

Chapter	I . . .	ROOTS
Chapter	II . . .	RHIZOMES
Chapter	III . . .	ROOTS AND RHIZOMES
Chapter	IV . . .	TUBEROUS ROOTS, BULBS, AND CORMS
Chapter	V . . .	BARKS
Chapter	VI . . .	WOODS
Chapter	VII . . .	STEMS
Chapter	VIII . . .	PLANTS
Chapter	IX . . .	HERBS
Chapter	X . . .	LEAVES AND FLOWERING TOPS
Chapter	XI . . .	LEAF BUDS, LEAFLETS, AND LEAVES
Chapter	XII . . .	FLOWER BUDS, FLOWERS, FLOWER HEADS, AND PARTS OF FLOWERS
Chapter	XIII . . .	FRUITS AND PARTS OF FRUITS
Chapter	XIV . . .	SEEDS AND PARTS OF SEEDS
Chapter	XV . . .	ALGÆ AND FUNGI
Chapter	XVI . . .	SPORES, NON-GLANDULAR AND GLANDULAR HAIRS AND EXCRESCENCES

Chapter XVII . . .	STARCH, GUMS, SUGARS, AND MUCILAGE
Chapter XVIII . . .	RESINS, GUM RESINS, BALSAMS, BALSAMIC RESINS AND OLEO- RESINS
Chapter XIX . . .	LATEX, DRIED JUICES, EXTRACTS AND CAMPHORS
Chapter XX . . .	DRUGS OF ANIMAL ORIGIN
Appendix	USEFUL TABLES, GLOSSARY, AS- SAYS, ETC.
Index	

CHAPTER I

ROOTS

IN the study of roots the following must be considered: Occurrence, size, type, nature, stem bases and scars, texture, color, surface, fracture, outline, cortex, cambium or endodermis, wood or central cylinder, pith, odor and taste.

1. **Occurrence.** This refers to the condition of the root, whether *entire*, as parsley; or *broken*, as belladonna; or *cut*. If cut, the sections may be *transverse*, as in bryony; or *oblique*, as in calumba; or *longitudinal*, as in spikenard.

2. **Size.** The length may vary from a few millimeters, as in the broken pieces of most roots, to a meter or more, as in Mexican sarsaparilla. The diameter may vary from 1 mm., as in Virginia snakeroot, to 9.7 cm., as in *phytolacca*.

3. **Type.** This refers to the position of the root, whether *vertical*, usual position, as in pyrethrum; or *oblique*, as in senega; or *horizontal*, as in senega. In most roots with numerous branches, both *horizontal* and *oblique* types occur.

4. **Nature.** This refers to the shape of the root, whether *simple*, as in pyrethrum; or branched, as in senega; or *straight*, as in stillingia; or *twisted*, as in American burdock; or *crooked*, as in Rio ipecac.

5. **Stem Bases and Scars.** This refers to the remains of stems, as in Peruvian krameria, and to scars, as in burdock. The stems may be *short*, as in scammony; or *long*, as in ipecac. The stem scars may be *small*, as in senega; or *large*, as in pyrethrum.

6. **Texture.** The texture may be *non-fibrous*, as in parsley; *starchy*, as in bryony; *resinous*, as in pyrethrum; *waxy*, as in the cut surface of pareira; *granu-*

lar, as in asclepias; *horny*, as in European burdock; *fibrous*, as in phytolacca; *waxy and fibrous*, as in ipecac; *starchy and fibrous*, as in sarsaparilla; *resinous and fibrous*, as in baptisia; *granular and fibrous*, as in krameria.

7. **Color.** The color refers to the outer surface of the drug. The most common shades are the grays, yellows, browns and reds. The color of the different drugs is given under the description, and the variation is fairly uniform. The color of drugs is important, because it is a criterion of quality. Off-color indicates improper collecting, drying, shipping or storing of drugs. Experience in handling drugs is necessary in order to acquire a knowledge of color values.

8. **Surface markings.** The surface is *furrowed* when it has sharply defined, parallel elevations and depressions, as in Mexican sarsaparilla. Furrows may form straight parallel lines, as in Mexican sarsaparilla, or they may be spirally arranged, as in scammony root. The surface is *wrinkled* when it is irregularly contracted into furrows, as in bryony and in pyrethrum. The surface is *fissured* when it has narrow openings caused by the separation of the tissues. The fissures may be shallow, as in stillingia, or deep, as in Savanilla krameria and in Carthagenia ipecac. The surface is *sunken* when it is depressed because of the shrinking of the inner tissue, as in jalap; *cleft* when it has irregular openings caused by the separation of the tissues, as in Russian licorice; *split* when it has longitudinal breaks in the tissue caused by cutting it into pieces, as in berberis and in gelsemium; *keeled* when it has a longitudinal ridge or elevation of the cortex, beginning at the crown and extending toward the root, as in senega; *annulated* when it has transverse parallel elevations or outgrowths of tissue. It may be incompletely annulate, as in phytolacca; or completely annulate, as in parsley root. The surface is *nodulated* when it is extended as a rounded, knot-like mass of tissue, as in wild yam; *abraded* when the outer layers have been removed by the friction resulting from handling and transporting the drug, as in

belladonna root; *smooth* when it has no perceptible projections or depressions, as in cut sections of belladonna root.

9. **Fracture.** The term *fracture* refers to the manner in which a root breaks when it is subjected to sufficient pressure. In determining the fracture, place the drug between the thumbs and the two adjacent fingers. Press the thumbs outward until they come together. If the drug breaks clear across it has a *complete fracture*. Belladonna root, and most roots, in fact, have a complete fracture. If the drug breaks only part way, it has an *incomplete fracture*. All the sarsaparillas and spikenard have an incomplete fracture. When the root is too tenacious to be fractured, the *broken surface* is spoken of. Pareira is so tenacious that it requires a sharp blow of a hammer or a hatchet to break the surface. If the root bends instead of breaking when subjected to pressure, it has *no fracture* or is *fractureless*, as the roots of the convallaria, caulophyllum, aletris and helonias. Drugs with a complete fracture or an incomplete fracture or a broken surface are divided into seven groups: (1) Those having a *very weak, brittle fracture*, as the roots of American angelica, senega, spigelia and serpentaria; (2) those having a *weak, brittle fracture*, as parsley root; (3) those having a *brittle fracture*, as the roots of burdock, rumex and belladonna; (4) those having a *tough fracture*, as pyrethrum; (5) those having a *strong, tough fracture*, as licorice, stillingia and echinacea; (6) those having a *very strong, tough fracture*, as phytolacca; (7) those which are too tough to be fractured, but are breakable, as pareira, asclepias, hydrangea, krameria and scammony. In a few drugs the cortex is brittle and the wood is tough, as in Rio ipecac, Carthagena ipecac, the kramerias and baptisia. When a fracture is made, the nature of the fractured surface should be observed. It is *concordal* if the surface is curved; *even*, if the surface is plain; *uneven*, if the surface is rough; and *hackly*, if the surface is sharp and jagged. These terms are combined with the classifications of brittle and tough fractures

to denote fractures. Calumba has a *brittle, concordal fracture*; senega has a *very weak, brittle, even fracture*; burdock has a *brittle, uneven fracture*; hydrangea has a *very strong, tough, hackly fracture*. Fracture is an aid to the identification of drugs; therefore it should be kept in mind when drugs are selected. Many drugs when exposed to moisture will absorb water and become pliable. This is caused by the softening of the tissue by the absorbed water. Parsley root is an example of such a drug. When parsley root is pliable it contains an excess of moisture; it is, therefore, deficient in strength and is likely to become mouldy. Fracture, or lack of fracture, is in most cases a criterion of the quality of the drug.

10. **Outline.** The outline of roots refers to the form of the oblique, or longitudinal, or cross sections of the root. In most roots the outlines are,—cylindrical, as in krameria; in others it is nearly circular, as in stillingia; or oval, as in calumba; or rectangular, as in phytolacca; or irregular, as in rumex; or as in cross-sections of most cut roots, as in belladonna root. The outline may also be wavy, as in scammony root.

11. **Cortex.** The cortex includes everything outside the cambium or endodermis. When the cortex is studied, the diameter, the color, and the markings must be considered. The diameter varies from 1 mm., as in senega, to 6 mm., as in calumba. For every drug there is a fairly uniform maximum diameter—i.e., the cortex of roots growing under normal conditions does not exceed a certain diameter. The ratio of the diameter of the cortex to that of the central cylinder should also be kept in mind. In the majority of roots the central cylinder or wood is thicker than the cortex. This point is well illustrated in krameria and in Carthagenia ipecac. In other roots, the cortex is thicker than the central cylinder. The color of the cortex, which is given under the description of each drug, varies in different roots. Frequently the cortex is of one color and the wood of another, as in krameria. The markings, or macroscopic structures, of the cortex must be kept in mind. The cortex of European angelica

has prominent round resin cavities with resin; parsley has less distinct resin cavities; the cortex of stillingia root also has small resin cells; the cortex of calumba is radiate; baptisia is less distinctly radiate; the cortex of althæa has concentric lines composed of mucilage cells. Many roots have no characteristic markings in the cortex.

12. **Cambium.** The cambium increases the growth (diameter) of the root by the addition of new cells to the wood and to the cortex. The cambium zone occurs between the cortex and the wood. It is usually very distinct, as in belladonna; or indistinct, as in baptisia. In the latter case the cortex appears to come directly in contact with the wood. It should be remembered, however, that a cambium zone is present even if not distinguishable.

13. **Endodermis.** Endodermis is a term applied to a layer of cells surrounding the central conducting strand (stele) of roots and rhizomes of plants having one seed leaf (monocotyledonous plants). Such an endodermis is faintly seen in the cross-section of Mexican sarsaparilla root.

14. **Wood.** The wood includes everything within the cambium zone, as in calumba. When the wood is studied, its diameter, its color, and its markings should be considered. The diameter varies from less than 2 mm., as in Rio ipecac, to 10.5 cm., as in the sections of a large bryony root. The color of the wood, which is given under the description, varies in different roots. An odd case of coloring occurs in krameria, the central portion of which is darker than the outer; and in pyrethrum, the radiate portion of which is yellow. It differs in many cases from the color of the cortex, as in calumba. The markings of the wood are frequently diagnostic. The wood of belladonna and rumex is finely radiate; pyrethrum is prominently radiate; calumba is interruptedly radiate. The wood of phytolacca is divided into concentric zones. The wood of senega has a V-shaped, undeveloped portion. The wood of scammony has a mottled surface caused by alternating masses of yellowish conducting tissue

and light-colored parenchymatic tissue. Longitudinal sections of the wood of *phytolacca* have parallel ridges. In *krameria* and other roots the wood has no characteristic markings. The *pith* may be of small diameter, as in *pareira*; or of large diameter, as in *calumba*. In European burdock it is hollow or cleft.

15. Central Cylinder. The central cylinder is everything within the endodermis. In the *sarsaparillas* it is porous.

16. Odor. In order to judge of the genuineness of many drugs a knowledge of odors is necessary. This knowledge is acquired only by considerable practice in smelling drugs. It is impossible to describe an odor so minutely that one unfamiliar with a drug can recognize it from a description of its odor, or to distinguish between two odorous drugs by the description alone. Most drugs with characteristic odors give off aromatic or volatile constituents. Drugs giving off such volatile constituents are called *aromatic drugs*. The odors of aromatic drugs differ in kind as well as in degree. When one has learned to associate a particular odor with a certain drug, odors become, as it were, diagnostic. Odors are qualified as faint or strong, pleasing or displeasing, and pungent. There are several roots with characteristic odors. These are *parsley*, *inula*, *belladonna*. There are many roots, such as *belladonna*, *phytolacca*, the *sarsaparillas*, the *kramerias*, *wild yam* and *pleurisy*, which have no characteristic or pronounced odor. These are classed as *odorless* roots.

17. Taste. The taste of many drugs is characteristic; and since many drugs have similar tastes, it is possible to classify them according to taste. Taste may be simple—i.e., one taste only; or complex—i.e., two or more tastes. (a) *Simple Tastes.* The important simple tastes are mucilaginous, starchy, sweet, bitter, astringent, pungent, acrid, tingling and aromatic. Of the official roots, *lappa* has a mucilaginous taste; *stilingia*, a starchy taste; *licorice*, a sweet taste; *calumba*, a bitter taste; *krameria*, an astringent taste; *wild indigo*, a pungent taste; *pyrethrum*, *senega*, and *stil-*

lingia, acrid tastes; echinacea, a tingling taste; inula, an aromatic taste. (b) *Complex Tastes*. Several roots have complex tastes. In each case the first taste experienced is placed first, the second taste placed second, etc. Parsley has a sweet, pleasingly aromatic taste; althæa, a starchy, sweet, mucilaginous taste; sarsaparilla, a starchy, mucilaginous, sweet and acrid taste. Both the simple and complex tastes may be qualified—i.e., weakly or strongly acrid, etc.; and the aromatic taste may be classed as pleasingly or disagreeably aromatic, as well as weakly and strongly aromatic.

It should be remembered, however, that taste is an aid to, and not a positive means of, identifying the average drug.



SARSAPARILLA—MEXICAN

1, A typical curved and twisted root. 2, A cut root showing the woody central cylinder. 3, Furrowed surface of the root. 4, Cross-section of the root showing the endodermis.

SARSAPARILLA (Sarsap.) U. S. P.

(1) Mexican Sarsaparilla

English name: Sarsaparilla.

Synonyms: Mexican Sarsaparilla, Gray Sarsaparilla.

Botanical origin: *Smilax medica* Chamisso and Schlechtendal. (Fam. *Liliaceæ*.)

Part used: Root.

Impurities: None given in the Pharmacopœia.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Tropical America, Mexico and Vera Cruz.

Description:

Mexican sarsaparilla comes to market in the form of bales wound with three or four wire bands. The bales are composed of a great number of separate clusters of roots attached to a crown which bears several stem bases. The crown frequently has 150 roots attached to it. The stems are angled and thorny, and the surface is smooth and yellowish white. The crown is gnarled, hard, and woody. The stem and crown must not be used. The dirt stems and crowns make up about 25 per cent. of the drug. The roots are tortuous and variable in diameter; the larger roots have a maximum diameter of 6 mm. A few of the roots have rootlets. The texture is very slightly starchy and fibrous. The color varies from light brownish gray to nearly black. The blackness is caused by adhering particles of soil. The surface is deeply furrowed longitudinally. The fracture of the cortex is brittle, even, and complete; of the central cylinder, tough and half-complete. The outline is irregular and wavy. The cortex is less starchy than the other sarsaparillas, and it frequently has cavities near the central cylinder, from which it separates in drying. The central cylinder is brownish yellow and porous. The pith is grayish white and starchy. The odor is not characteristic. The taste is slightly starchy, mucilaginous, sweet and acrid.

Constituents: Smilacin, saponin, starch, resin, volatile oil, pectin, etc.

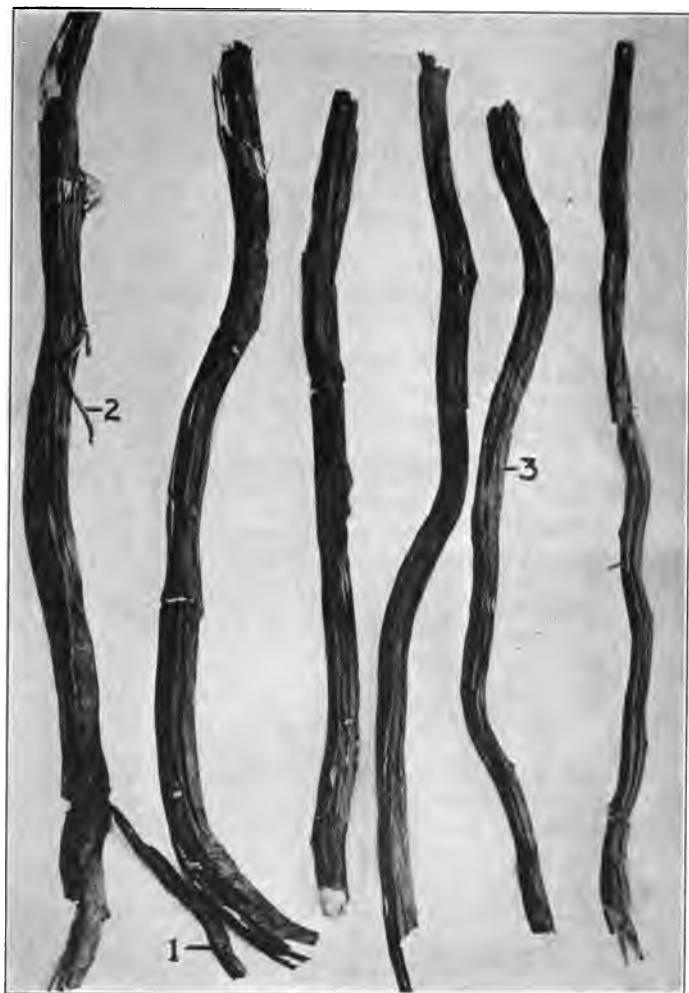
Preparations:

Decoctum Sarsaparillæ Compositum N. F.; Dose, 120 mls (4 fl. ozs.).

Fluidextractum Sarsaparillæ; Dose, 2 mls (30 min.).

Fluidextractum Sarsaparillæ Compositum; Dose, 2 mls (30 min.).

Syrupus Sarsaparillæ Compositus (from Fluidextract); Dose, 15 mls (4 fl. drs.).



SARSAPARILLA—HONDURAS

1, A large branch. 2, A small rootlet. 3, Shallow furrows.

SARSAPARILLA (Sarsap.) U. S. P.

(2) Honduras Sarsaparilla

English name: Sarsaparilla.

Synonyms: Honduras Sarsaparilla, Brown Sarsaparilla.

Botanical origin: *Smilax officinalis* Kunth, or an undetermined species of smilax. (Fam. *Liliaceæ*.)

Part used: Root.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Tropical America, Honduras and adjacent territory.

Description:

Honduras sarsaparilla comes to market in the form of bales, partially covered by two pieces of hide laced together with thongs of hide. These bales contain about 50 rolls. The individual rolls measure up to 75 cm. in length and up to 10 cm. in diameter. They are composed of roots folded lengthwise and wound tightly with long roots externally to within a few centimeters of the ends of the roll. The roots are tortuous and vary in diameter, the maximum diameter being 5 mm. The individual roots are nearly uniform. A few of the roots have rootlets. The *texture* is partly starchy and partly woody. The *color* is dark reddish brown. The *surface* is longitudinally furrowed. The *fracture* of the bark is brittle, even and complete; of the wood, tough and half-complete. The *outline* is wavy. The *cortex* is starchy and thinner than the central cylinder. The *color* varies from gray to nearly white. The *central cylinder* is woody, porous, and yellowish brown. The *pith* forms the greater part of the central cylinder and is grayish white and starchy. The *odor* is not characteristic. The *taste* is starchy, mucilaginous, slightly sweet and acrid.

Constituents: Smilacin, saponin, starch, resin, volatile oil, pectin, etc.

Dose: 2 Gm. (30 grains).

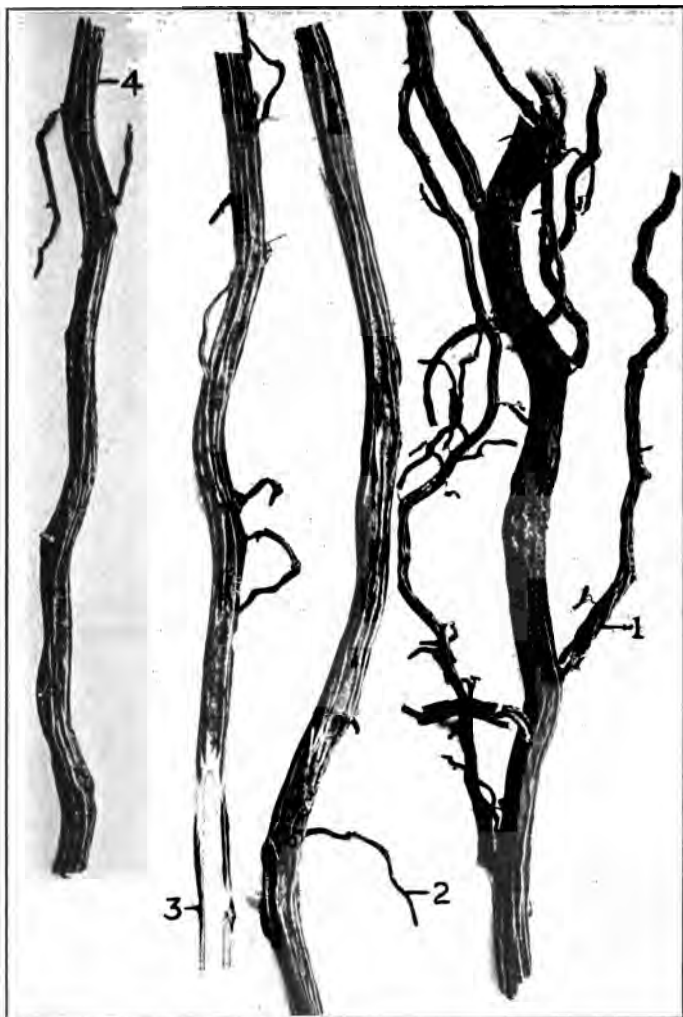
Preparations:

Decoctum Sarsaparillæ Compositum N. F.; Dose, 120 mls (4 fl. ozs.).

Fluidextractum Sarsaparillæ; Dose, 2 mls (30 min.).

Fluidextractum Sarsaparillæ Compositum; Dose, 2 mls (30 min.).

Syrupus Sarsaparillæ Compositus (from Fluidextract); Dose, 15 mls (4 fl. drs.).



SARSAPARILLA—JAMAICA

1, A typical root with numerous rootlets. 2, A very small rootlet. 3, A cut root, showing the woody central cylinder. 4, Typical furrow.

SARSAPARILLA (Sarsap.) U. S. P.

(3) Jamaica Sarsaparilla

English name: Sarsaparilla.

Synonyms: Jamaica Sarsaparilla, Red Sarsaparilla.

Botanical origin: *Smilax ornata* Hooker filius. (Fam. *Liliaceæ*.)

Part used: Root.

Impurities: None given.

Assay: None given.

Ash: 10 per cent. or less.

Habitat: Tropical America, Jamaica, Costa Rica.

Description:

Jamaica sarsaparilla comes to market in burlap bales. The bales are composed of bundles of roots freed from the crown, folded lengthwise, and wound loosely with a long root. The roots are tortuous and have numerous branches with rootlets. Their maximum diameter is 5 mm. The texture is non-starchy or slightly starchy and woody. The color is yellowish or reddish brown. The surface is longitudinally furrowed, the furrows being shallow and numerous. The fracture of the cortex is brittle, even and complete; of the central cylinder, tough and half-complete. The outline is very irregular and wavy. The cortex is thin and mostly non-starchy. The central cylinder is brownish yellow and porous. The pith is grayish white and starchy. The odor is not characteristic. The taste is sweet, slightly mucilaginous and acrid.

Constituents: Smilacin, saponin, starch, resin, volatile oil, pectin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Decoctum Sarsaparillæ Compositum N. F.; Dose, 120 mls (4 fl. ozs.).

Fluidextractum Sarsaparillæ; Dose, 2 mls (30 min.).

Fluidextractum Sarsaparillæ Compositum; Dose, 2 mls. (30 min.).

Syrupus Sarsaparillæ Compositus (from Fluidextract); Dose, 2 mls (30 min.).



BAPTISIA

1. A typical root with numerous branches. 2. Elevated root scar. 3. Cross-section showing the thick cortex. 4. Longitudinal section.

BAPTISIA (Baptis.) N. F.

English name: Baptisia.

Synonyms: Wild Indigo.

Botanical origin: *Baptisia tinctoria* (Linné) R. Brown.
(Fam. *Leguminosæ*.)

Part used: Root.

Impurities: Not more than 10 per cent. of the crown and stem or other matter.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Eastern United States.

Description:

Baptisia occurs as cut and broken fragments, varying in length and diameter. The individual roots are simple or branched, and are frequently attached to a woody crown bearing one or more stem bases. The *texture* is resinous and woody. The largest roots have a maximum diameter of 15 mm. The *color* is light brownish yellow. The *surface* is finely wrinkled longitudinally and has many elevated root scars. The *fracture* is tough, strong, uneven and incomplete. The *outline* is nearly cylindrical. The *cortex* is about one-half as thick as the wood, dark brown, with numerous black resinous cavities, and radiate. The *wood* is yellowish, fibrous, slightly porous and finely radiate. The *odor* is slightly aromatic. The *taste* is strongly bitter, acrid and tingling.

Constituents: Glucosides (baptisin, baptin), resin, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Baptisæ; Dose, 1 mil (15 min.).



KRAMERIA—PERUVIAN

1, Large crown. 2, Clusters of small roots. 3, Older root with rough, scaly surface. 4, Younger root with smooth surface. 5, Light outer zone of wood. 6, Dark central zone of wood.

KRAMERIA (Kramer.) N. F.

(1) Peruvian Krameria

English name: Krameria.

Synonyms: Peruvian Rhatany.

Botanical origin: *Krameria triandra* Ruiz et Pavon.
(Fam. *Leguminosæ*.)

Part used: Root.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: Not less than 9 per cent. of aqueous extractive.

Ash: Not more than 5 per cent.

Habitat: Peru and Bolivia.

Description:

Peruvian krameria occurs as whole and broken roots mixed. These are branched and measure up to 30 cm. in length and up to 9.5 cm. in diameter at the crown. The crown bears numerous short stem bases, and it tapers into the main root, which has numerous branches. The texture of the cortex is granular; of the wood, fibrous. The color of the smaller roots is light reddish brown; of the larger roots, dark reddish brown. The surface of the smaller roots is nearly smooth; of the larger roots, rough and scaly. The fracture of the cortex is very brittle and hackly; that of the wood, very tough and hackly. The outline of sections of small roots is cylindrical. The cortex is not so thick as that of the *Savanilla Krameria*. The color is dull reddish brown. The wood has a yellowish brown outer zone and a nearly black central zone. The entire surface may be of a uniform brown color. The odor is not characteristic. The taste is astringent.

Constituents: Tannin, starch, gum, wax, coloring matter, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Extractum Krameriaë; Dose, 0.5 Gm. (8 grains).

Fluidextractum Krameriaë; Dose, 1 mil (15 min.).

Fluidglyceratum Krameriaë; Dose, 1 mil (15 min.).

Syrupus Krameriaë; Dose, 4 mls (1 fl. dr.).

Tinctura Krameriaë; Dose, 4 mls (1 fl. dr.).



KRAMERIA—SAVANILLA

1, Typical branched root. 2, Large transverse fissure. 3, Root with numerous fissures. 4, Cross-section of root.

KRAMERIA (Kramer.) N. F.

(2) *Savanilla Krameria*

English name: Krameria.

Synonyms: *Savanilla Rhatany*.

Botanical origin: *Krameria Ixina* Linné. (Fam. *Leguminosæ*.)

Part used: Dried root.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: Not less than 9 per cent. of aqueous extractive.

Ash: Not more than 5 per cent.

Habitat: Mexico and Northern South America.

Description:

Savanilla krameria occurs as broken pieces of the roots. The roots are simple, rarely branched. They measure up to 13 mm. in diameter. Crowns and stem bases have never been observed. The texture of the bark is granular; of the wood, fibrous. The color varies from a deep reddish to chocolate brown. The surface has numerous slight longitudinal ridges and transverse fissures, which frequently extend to the wood. The fracture of the cortex is very brittle and even; that of the wood, very tough and hackly. The outline of sections is cylindrical. The cortex is thick, dark chocolate brown, and has no distinctive structure. The wood is yellowish brown and finely fibrous. The odor is not distinct. The taste is strongly astringent.

Constituents: Tannin, starch, gum, wax, coloring matter, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Extractum Krameria; Dose, 0.5 Gm. (8 grains).

Fluidextractum Krameria; Dose, 1 mil (15 min.).

Fluidglyceratum Krameria; Dose, 1 mil (15 min.).

Syrupus Krameria; Dose, 4 mls (1 fl. dr.).

Tinctura Krameria; Dose, 4 mls (1 fl. dr.).



PAREIRA

1, A large root with small rootlets. 2, Branched root. 3, Cross-section showing eccentric zones of tissue. 4, Cross-section showing concentric zones of tissue. 5, Cross-section of small root.

PAREIRA (Pareira) N. F.

English name: Pareira.

Synonyms: Pareira Brava.

Botanical origin: *Chondodendron tomentosum* Ruiz
et Pavon. (Fam. *Menispermaceæ*.)

Part used: Root.

Impurities: Not more than 5 per cent. of stems or
other foreign matter.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Peru, Brazil.

Description:

Pareira occurs as long transverse pieces. The roots are simple or branched, with few small rootlets. They measure up to 6.5 cm. in diameter. The stems, which may be present, are cut in long, transverse pieces. They are greenish gray with scattered patches of lichens and with black apothecia (fruiting bodies). The cross-sections show concentric layers of radiating conducting tissue separated by narrow medullary rays. The surface is a dull gray. The texture of the roots is fibrous. The color is a dull brownish black. The surface is rough, with numerous incomplete transverse ridges, or it is nodulated, with irregular depressions. The fracture is very strong, tough and hackly. The outline is cylindrical and irregular. The cortex, which is light brown, is very thin and undulate. The wood shows several concentric or eccentric zones of conducting tissue separated by concentric zones of parenchymatic tissue. The concentric and eccentric zones of conducting tissue are composed of wedge-shaped masses with large pores (vessels), separated by broad medullary rays filled with starch. The odor is not distinct. The taste is strongly bitter.

Constituents: Alkaloid (buxine), fat, starch, gum,
tannin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Pareiræ; Dose, 2 mls (30 min.).



SCAMMONIÆ RADIX

- 1, Crown with stem scars and bases. 2, Twisted root with deep furrows. 3, Cross-section showing mottled surface. 4, Fractured surface.

SCAMMONIÆ RADIX (Scam. Rad.) U. S. P.

English name: Scammony Root.

Synonyms: None commonly known.

Botanical origin: *Convolvulus Scammonia* Linné.
(Fam. *Convolvulaceæ*).

Part used: Root.

Impurities: None given officially.

Assay: Not less than 8 per cent. of the total resins of Scammony Root.

Ash: None given.

Habitat: Western Asia.

Description:

Scammony root *occurs* as a mixture of entire and broken pieces. The roots are mostly simple and twisted, with few rootlets. They measure up to 43 cm. in length, and up to 4.8 cm. in diameter. The crown is enlarged, and in the older roots it often has twenty-five stem bases or scars. The *texture* is resinous and ~~fibrous~~. The *color* varies from gray to yellow or reddish brown. The *surface* has longitudinal furrows, which are spiral in the twisted portion of the root. If old, the root scars are slight depressions; if recent, elevations. The *fracture* is very strong, tough, and uneven. The *outline* is cylindrical and irregular. The *cortex* is of unequal thickness, slightly radiate and dark in the region of the cambium. The *wood* is strongly porous and radiate near the cambium. It has scattered yellowish wood bundles separated by white or yellowish white parenchyma. This gives the wood a mottled appearance. The *odor* is slightly aromatic. The *taste* is slightly sweet and strongly acrid.

Constituents: Resin (scammonin), etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

Enters into Extractum Colocynthis Compositum (from resin);

Dose, 0.25 Gm. (4 grains).

Resina Scammoniae; Dose, 0.2 Gm. (3 grains).



PHYTOLACCA

1, Longitudinal section. 2, A typical cross-section. 3, Concentric woody or fibrous tissue. 4, Incompletely annulate surface. 5, Cross-section of small root.

PHYTOLACCA (Phytolac.) N. F.

English name: Phytolacca.

Synonyms: Poke Root, Ink-berry Root.

Botanical origin: *Phytolacca decandra* Linné. (Fam. *Phytolaccaceæ*.)

Part used: Root.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 14 per cent.

Habitat: Northeastern, Central and Southern United States.

Description:

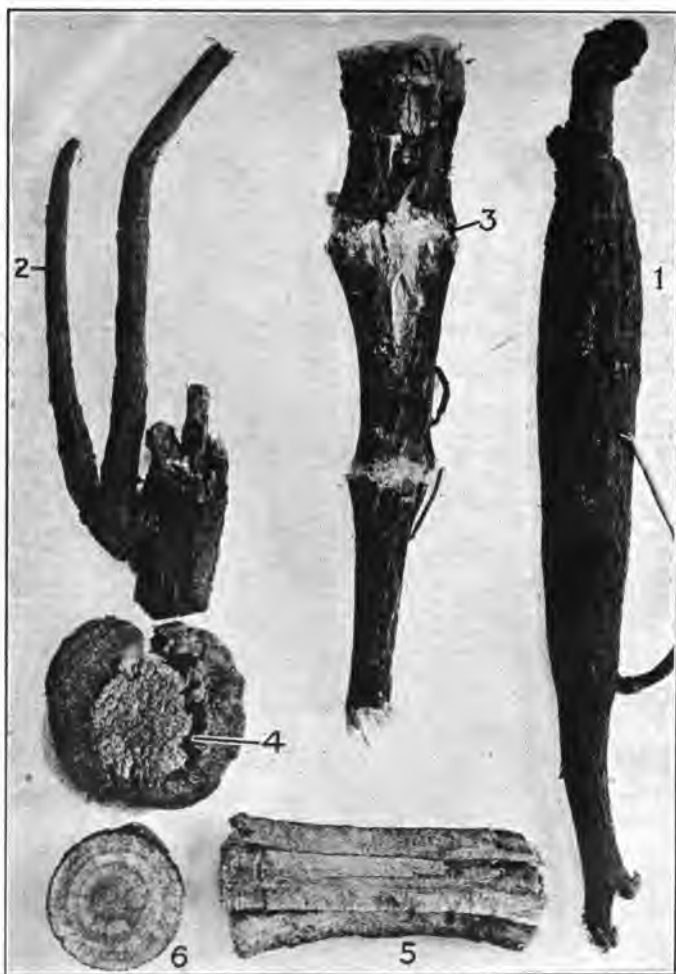
Phytolacca occurs as a mixture of entire, broken, transverse, longitudinal, and oblique sections. The roots vary in length up to 5 dm. and in width up to 9.7 cm. The uncut roots are simple or branched. The texture is coarsely fibrous. The color varies from light yellowish to grayish brown. The surface is irregularly wrinkled longitudinally and incompletely annulate; the ridges are very light yellow. The fracture is very strong, tough and hackly. The outline is circular or oval and irregular. The cortex is thin and brown. The wood in transverse sections shows concentric ridges of elevated fibrous tissue, between which are sunken masses of parenchymatic tissue; longitudinal sections show parallel ridges of fibrous tissue. The color varies from whitish brown to gray. The odor is not characteristic. The taste is slightly sweet and strongly acrid.

Constituents: Resin, tannin, phytolaccin, asparagin, sugar, starch, etc.

Dose: Emetic, 1 Gm. (15 grains); Alterative, 0.1 Gm. (1½ grains).

Preparations:

Fluidextractum Phytolacæ; Dose, Emetic, 1 mil (15 min.); Alterative, 0.1 mil (1½ min.).



STILLINGIA

1, Typical root tapering toward the ends. 2, Stems, which are usually present in the drug. 3, Partially cut root, showing fibrous nature of the cortex. 4, Cross-section showing cortex separated from the wood. 5, Longitudinal section. 6, Cross-section showing concentric and radiate structure.

STILLINGIA (Stilling.) U. S. P.

English name: Stillingia.

Synonyms: Queen's Root, Queen's Delight.

Botanical origin: *Stillingia sylvatica* Linné. (Fam. *Euphorbiaceæ*.)

Part used: Root.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Southern United States, from Virginia to Texas.

Description:

Stillingia root occurs as a mixture of entire, cut, and as partially cut pieces. The roots are entire or branched. The branches curve upward when dry. The typical root has a smaller diameter at the ends than in the center. It measures up to 45 cm. in length, and up to 3.5 cm. in diameter. The crown frequently bears one or more hard, woody, purplish brown stems. The texture is soft fibrous. The color is dark reddish or chocolate brown. The surface is longitudinally striated and has many shallow transverse fissures. The fracture is strong, tough and uneven. The outline is nearly cylindrical and slightly wavy. The cortex is thick, soft fibrous, and frequently slightly separated from the wood. It is pinkish brown and has numerous dark resin cavities. The wood has a concentric and radiate structure and is pinkish white. The odor is not characteristic. The taste is slightly sweet, acrid and bitter.

Constituents: Tannin, volatile oil, fixed oil, starch, gum, resin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum *Stillingiæ*; Dose, 2 mls (80 min.).

Fluidextractum *Stillingiæ* Compositum N. F.; Dose, 2 mls (80 min.).

Syrupus *Stillingiæ* Compositus N. F.; Dose, 4 mls (1 fl. dr.).



RUMEX—CURLED

1, Twisted root. 2, Transverse and longitudinal sections.
3, Stem of the plant. 4, The thick cortex. 5, Radiate
wood.

RUMEX N. F.

(1) Curled Rumex

English name: Rumex.

Synonyms: Curled Dock.

Botanical origin: *Rumex crispus* Linné. (Fam. *Polygonaceæ*.)

Part used: Root.

Impurities: Not more than 5 per cent. of stem bases.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Europe and Asia; naturalized in United States and Canada.

Description:

Curled rumex occurs as entire roots, as transverse, and as longitudinal slices. The entire roots are simple or branched and twisted. They measure up to 80 cm. in length and up to 25 mm. in diameter. The crown frequently bears a portion of the stem, which is purplish brown, longitudinally striated, and has a large purple pith. The texture of the root is partially fibrous. The color is dark reddish brown. The surface has numerous slightly elevated transverse ridges, longitudinal furrows, and few fine rootlets. The fracture is brittle when the root is dry, but pliable when it is moist. The outline of the cross-sections is very irregular and wavy. The cortex is yellowish brown and finely radiate. The cambium zone is dark brown. The wood has a distinct radial structure composed of numerous yellowish masses of conducting tissues. The pith is light yellow and has numerous scattered isolated strands of conducting tissue. The odor is not characteristic. The taste is slightly sweet, astringent and bitter.

Constituents: Chrysophanic acid, emodin, tannin, rumicin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Rumicis; Dose, 4 mls (1 fl. dr.).



RUMEX—BROAD-LEAVED

1, A twisted, furrowed root, annulate at the crown. 2, Numerous transverse and longitudinal sections. 3, Stems of the plant. 4, Wavy cortex. 5, Wood of irregular diameter.

RUMEX N. F.

(2) Broad-leaved Rumex

English name: Rumex.

Synonyms: Yellow Dock Root, Broad-leaved Rumex, Broad-leaved Dock Root.

Botanical origin: *Rumex obtusifolius* Linné. (Fam. Polygonaceæ.)

Part used: Root.

Impurities: Not more than 5 per cent. of stem bases.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Europe, Asia; naturalized in United States and Canada.

Description:

Broad-leaved rumex occurs as a mixture of entire roots and as transverse or longitudinal sections of roots. The entire roots are simple or branched and twisted, and they measure up to 85 cm. in length and up to 30 mm. in diameter. The stem is striated and purple with fragments of leaf scales; the center is usually hollow. The texture is slightly fibrous. The color is pale yellowish brown. The surface of the roots is mostly free of annulate portions. They are finely furrowed longitudinally and have few fine rootlets or root scars. The fracture is brittle when the root is dry, but pliable when it is moist. The outline of the cross-sections is cylindrical or irregular. The cortex is dark greenish yellow, thick and finely radiate. The cambium zone is nearly black. The wood frequently separates from the cambium upon drying. The outer part is very fibrous and grayish white; the central part is yellow or brown. The odor is not characteristic. The taste is slightly sweet and astringent.

Constituents: Chrysophanic acid, emodin, tannin, rumicin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Rumicis; Dose, 4 mls (1 fl. dr.).



ALTHÆA

1, Longitudinal section showing dark cambium zone. 2, Longitudinal furrow. 3, Irregular cut pieces. 4, Cross-section showing wavy cortex, dark cambium zone and wood.

ALTHÆA U. S. P.

English name: Althæa.

Synonyms: Marsh Mallow Root, White Mallow Root.

Botanical origin: *Althæa officinalis* Linné (Fam. *Malvaceæ*) deprived of the brown, corky layer and small roots.

Part used: Root.

Impurities: None given in Pharmacopœia.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Europe, Asia; cultivated.

Description:

Althæa occurs as peeled, entire, or as small cut pieces of the peeled root. The roots are simple or branched and straight or twisted. The branches are usually separated when the root is peeled. Entire roots measure up to 35 cm. in length and up to 22 mm. in diameter. Stems have never been observed. The *texture* is fibrous and starchy. The *color* varies from gray to yellowish white. The *surface* has numerous long, projecting bast fibers, deep, longitudinal furrows, and many slightly elevated dark brown root scars. The *fracture* is very tough and uneven. The *outline* of sections of entire roots is irregular and wavy. The *cortex* is thick, and when magnified shows fine concentric dark-colored zones of sieve and mucilage tissue. The *cambium zone* is dark-colored. The *wood* is indistinctly radiate near the cambium. The *central portion* appears structureless and starchy. The *odor* is very slight. The *taste* is starchy, mucilaginous and sweet.

Constituents: Starch, mucilage, pectin, sugar, fat, asparagin (althein), betaine, etc.

Preparations:

Species Pectoralis N. F.; Dose, 4 Gm. (1 drachm).
Syrupus Althææ N. F.; Dose, 4 mĩls (1 fl. dr.).



ASCLEPIAS

1, Large root with a rough surface and transverse depressions. 2, Irregular piece of root with sunken surface. 3, 4, Peeled root showing wavy lines of conducting tissue. 5, Transverse section with concentric and slightly radiate lines.

ASCLEPIAS (Asclep.) N. F.

English name: Asclepias.

Synonyms: Pleurisy Root, Butterfly Weed Root.

Botanical origin: *Asclepias tuberosa* Linné. (Fam. *Asclepiadaceæ*.)

Part used: Root.

Impurities: Not more than 5 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 9 per cent.

Habitat: Northern, Southern, Middle, and Middle Western United States.

Description:

Asclepias occurs as entire roots, as transverse and oblique slices, or as broken fragments. The roots are simple or rarely branched and have a few small rootlets free of cortex. Entire roots measure up to 26 cm. in length and up to 6 cm. in diameter. Stems are rarely present. They are circular, smooth, and hollow, and have an easily removed cortex. The *texture* is fibrous and starchy. The *color* is orange when recently gathered, but in time changes to light orange, and finally gray. The *surface* of the younger roots is nearly smooth, while that of the older roots is rough. This roughness is caused by the separation of the periderm and by numerous incomplete transverse depressions, caused by the shortening of the length of the root during drying. When the periderm is removed the surface is nearly white with darker-colored wavy lines of conducting tissue. Transverse sections show fine concentric and coarser radiating ridges. The *fracture* is very tough and uneven. The *outline* is irregularly rounded. The *cortex* is thin, hard and brittle. The *wood* has fine concentric and coarser radiating ridges. The *color* varies from nearly white with yellow conducting tissue to dull gray. The *odor* is not characteristic. The *taste* is bitter and acrid.

Constituents: Starch, tannin, albumin, pectin, gum, fat, volatile oil, resin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Asclepiadis; Dose, 2 mls (30 min.).



IPECACUANHA—CARTAGENA

1, A branched root. 2, A large root with numerous ridges and shallow fissures. 3, Stem portion of the plant above and root below. 4, A large fissure. 5, A small rootlet. The cross-section showing the cortex thicker than the wood is unnumbered.

IPECACUANHA (Ipecac.) U. S. P.

(1) Cartagena Ipecac

English name: Ipecac.

Synonyms: Cartagena Ipecac, Colombia Ipecac.

Botanical origin: *Cephaelis acuminata* Karsten.
(Fam. *Rubiaceæ*.)

Part used: Root.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: Not less than 1.75 per cent. of ether-soluble alkaloids.

Ash: Not less than 1.8 per cent. nor more than 4.5 per cent.

Habitat: Colombia.

Description:

Cartagena ipecac occurs as a mixture of entire, and as broken pieces of, roots. These roots are simple and branched and have many fine rootlets. They measure up to 15 cm. in length and up to 8 mm. in diameter. The stems are frequently as large as the roots, and they are very tough and woody. The texture of the cortex of the roots is horny; of the wood, fibrous. The color is grayish brown. The surface has a few low, incomplete transverse ridges, and a few narrow fissures. The fracture of the cortex is weak, brittle and even; that of the wood, strong, tough and even. The outline of cross-sections is nearly cylindrical. The cortex is grayish brown, horny, and slightly radiate when magnified, and it is thicker than the wood. The wood is yellowish white and finely fibrous. The odor is indistinct. The taste is bitter, nauseous and acrid.

Constituents: Alkaloids (emetine, cephaeline, etc.), starch, sugar, resin, choline, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Ipecacuanhæ; Dose, 0.05 mil (1 min.).
Pulvis Ipecacuanhæ et Opii; Dose, 0.5 Gm. (8 grains).
Syrupus Ipecacuanhæ (from fluidextract); Dose, Expecto-
rant, 1 mil (15 min.); Emetic, 15 mils (4 fl. drs.).
Syrupus Ipecacuanhæ et Opii N. F.; Dose, 4 mils (1 fl. dr.).
Tinctura Ipecacuanhæ et Opii N. F.; Dose, 0.5 mil (8 min.).
Vinum Ipecacuanhæ N. F.; Dose, 1 mil (15 min.).



IPECACUANHA—RIO

1, Stem above and root below. 2, Irregular transverse ridge. 3, A broad fissure. 4, Transverse section of the root.

IPECACUANHA (Ipecac.) U. S. P.

(2) Rio Ipecac

English name: Ipecac.

Synonyms: Rio Ipecac, Brazilian Ipecac.

Botanical origin: *Cephaelis Ipecacuanha* (Brotero)
A. Richard. (Fam. *Rubiaceæ*.)

Part used: Root.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: Not less than 1.75 per cent. of ether-soluble alkaloids.

Ash: Not less than 1.8 per cent. nor more than 4.5 per cent.

Habitat: Brazil, Bolivia; cultivated.

Description:

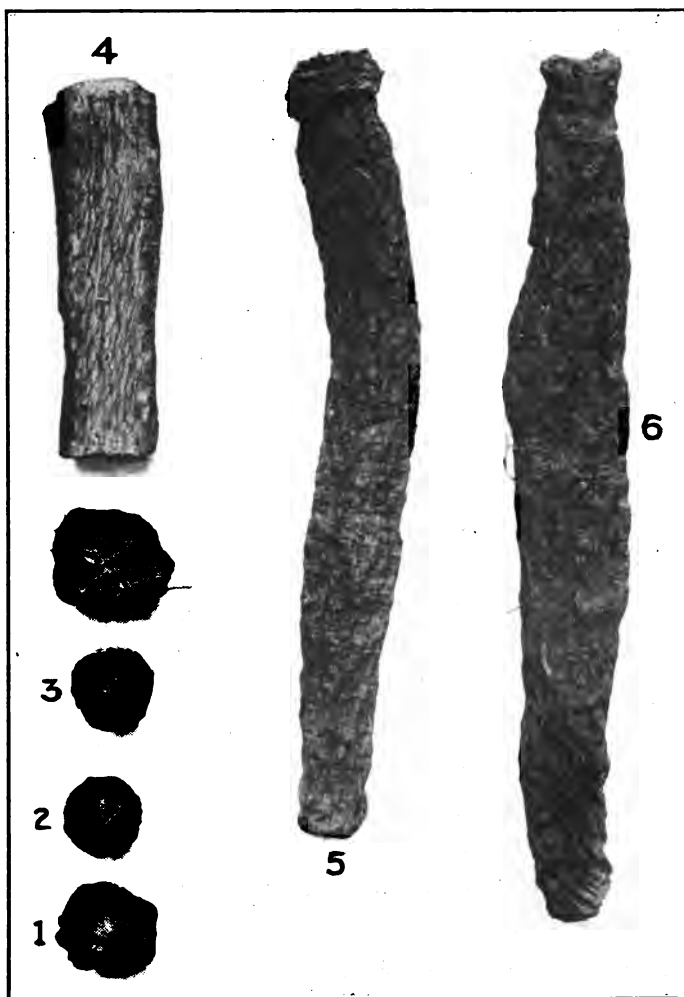
Rio ipecac occurs as entire or as broken pieces of roots. The roots are simple or branched and much twisted and crooked. They measure up to 18 cm. in length and up to 6 mm. in diameter. The stems have a smaller diameter than the roots, and they are very fibrous. The texture of the cortex of the root is waxy; of the wood, fibrous. The color varies from dark brown to nearly black. The surface has numerous incomplete transverse ridges and shallow or broad fissures, which extend to the wood. The outline of cross-sections is irregularly cylindrical. The fracture of the cortex is weak, brittle and even; that of the wood, strong, tough and even. The cortex is as thick as the wood and yellowish white. The cambium zone is dark brown. The wood is yellowish white and finely fibrous. The odor is not distinct. The taste is bitter, nauseous and acrid.

Constituents: Alkaloids (emetine, cephaeline, etc.), starch, sugar, resin, choline, etc.

Dose: (Emetic) 1 Gm. (15 grains).

Preparations:

Fluidextractum Ipecacuanhæ; Dose, 0.05 mil (1 min.).
Pulvis Ipecacuanhæ et Opii; Dose, 0.5 Gm. (8 grains).
Syrupus Ipecacuanhæ (from fluidextract); Dose, Expectorant,
1 mil (15 min.); Emetic, 15 mils (4 fl. drs.).
Syrupus Ipecacuanhæ et Opii N. F.; Dose, 4 mils (1 fl. dr.).
Tinctura Ipecacuanhæ et Opii N. F.; Dose, 0.5 mil (8 min.).
Vinum Ipecacuanhæ N. F.; Dose, 1 mil (15 min.).



PYRETHRUM

1, Broken surface showing radiate ridges. 2, Tuft of white fibers in center of the crown. 3, Crown showing concentric lines. 4, Out longitudinal surface showing wavy line. 5, Root with a large crown. 6, A slightly twisted spindle-shaped root.

PYRETHRUM (Pyreth.) U. S. P.

English name: Pyrethrum.

Synonyms: Pellitory Root, Roman Pyrethrum.

Botanical origin: *Anacyclus Pyrethrum* (Linné) De Candolle. (Fam. *Compositæ*.)

Part used: Root.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Northern Africa, Algeria almost wholly.

Description:

Pyrethrum occurs as whole and broken pieces, varying in length up to 14 cm. and in width up to 15 mm. The roots are mostly simple, slightly twisted, and frequently narrowed at either end. The crown is slightly enlarged, finely annulate, and marked above with projecting fibers. The center is hollow or it contains a tuft of white unicellular hairs. The surface is rough and wrinkled, occasionally longitudinally furrowed. The texture is resinous. The fracture is strong, tough and uneven. The outline is irregular and wavy. The cortex is resinous and dark yellowish brown. The wood is light yellow and marked with dark yellow radiating bands of tissue. The odor is aromatic. The taste is sweet, pungent, acrid and tingling.

Constituents: Volatile oil, pyrethrin, tannin, gum, fat, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Tinctura Pyrethri (used externally).



LAPPA—AMERICAN

1, Curved root with a crown and leaf bases. 2, Twisted root with a finely furrowed surface. 3, Longitudinal section showing partially hollow pith. 4, White hairs in center of the crown. 5, Larger crown showing concentric ridges. 6, White pith.

LAPPA N. F.
(1) American Lappa

English name: Lappa.

Synonyms: Burdock Root, American Burdock.

Botanical origin: *Arctium minus*. (Fam. *Compositæ*.)

Part used: Root.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Europe and United States.

Description:

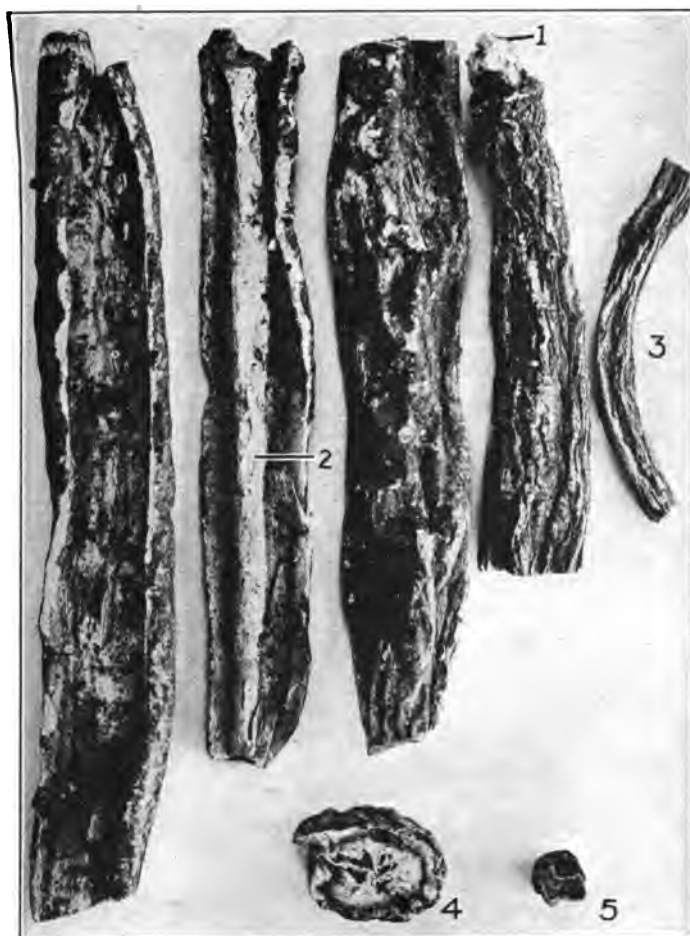
American lappa occurs as a mixture of entire, curved or twisted roots, as longitudinal slices, and as broken pieces. The roots are simple or branched, and they measure up to 25 cm. in length and up to 15 mm. in diameter. The crown is scaly, slightly annulate, and hollow above. The cavity is filled either with unicellular hairs of undeveloped leaves or with partially developed leaves. The texture is fibrous. The color varies from light grayish yellow to dark brown and is rarely abraded. The surface is finely furrowed and has few elevated root scars. The fracture is brittle and uneven. The outline of cross-sections is nearly circular. The cortex is yellowish brown and distinctly radiate. The wood has distinct yellowish radial conducting tissue near the cambium zone and a hollow or solid pith center. The odor is not characteristic. The taste is slightly sweet, mucilaginous and bitter.

Constituents: Volatile oil, tannin, bitter principle, inulin, sugar, fat, mucilage, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Lappæ. Dose, 2 mls (30 min.).



LAPPA—EUROPEAN

1, Crown with tuft of white hairs. 2, Longitudinal section showing the white pith and the incurved edges of the cortex. 3, Small curved root. 4, Large transverse section. 5, Small transverse section.

LAPPA N. F.
(2) European Lappa

English name: Lappa.

Synonyms: Burdock Root, Foreign Burdock, European Burdock.

Botanical origin: *Arctium Lappa* Linné. (Fam. *Compositæ*.)

Part used: Root.

Impurities: None given officially.

Assay: None mentioned.

Ash: Not more than 6 per cent.

Habitat: Europe and Northern Asia; sparingly naturalized in the United States, mostly in the Eastern States.

Description:

European lappa occurs as entire roots, as longitudinal, and as transverse slices or root. The entire roots are usually simple. They measure up to 30 cm. in length and up to 25 mm. in diameter. The crown is slightly annulate, hollow above and frequently filled with unicellular hairs of partially developed leaves. The texture is resinous and horny. The color is grayish brown or white where the surface has been abraded. The surface is irregularly longitudinally furrowed, and has slightly elevated root scars. The fracture is very brittle and uneven. The outline of cross-sections of entire roots is cylindrical; of cut slices, irregular. The cortex, which is yellowish gray or brown, is thin and slightly radiate. The cambium zone is blackish brown. The wood is yellowish white near the cambium and radiate. The pith is white and cleft or solid. The odor is not characteristic. The taste is sweet, mucilaginous and slightly bitter.

Constituents: Volatile oil, tannin, bitter principle, inulin, sugar, fat, mucilage, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Lappæ; Dose, 2 mls (30 min.).



BELLADONNÆ RADIX

1, Large root with a finely wrinkled and abraded surface. 2, Stem of the plant. 3, White abraded surface. 4, Dark cambium separating the cortex and wood. 5, White starchy wood. 6, Dark resinous wood.

BELLADONNÆ RADIX (Bellad. Rad.) U. S. P.

English name: Belladonna Root.

Synonyms: Deadly Nightshade Root.

Botanical Origin: *Atropa Belladonna* Linné. (Fam. *Solanaceæ*.)

Part used: Root.

Impurities: Not more than 10 per cent. of its stem bases or other foreign matter.

Assay: Not less than 0.45 per cent. of the total alkaloids of Belladonna Root.

Ash: Not more than 7 per cent.

Habitat: Southern and Central Europe; cultivated in Germany, England, and the United States.

Description:

Belladonna root occurs as entire or broken fragments, or as longitudinal sections, which vary in length up to 30 cm. and in diameter up to 2.7 cm. Stem bases are frequently present. They are woody, hollow, annulate and wrinkled. The roots are simple or branched. The texture is starchy, resinous and slightly fibrous. The color is grayish brown. The surface is longitudinally wrinkled with numerous white patches where the surface has been abraded. The fracture is weak, brittle, and even. The outline of entire roots is cylindrical; of cut roots, very irregular. The cortex is thick, white and starchy, or resinous and dark gray. Most sections show a dark zone in the region of the cambium. The wood is yellow and radiate. The pith is very thick and starchy. The odor is not characteristic. The taste is sweet, bitter and acrid.

Constituents: Starch, albumin, atrosin, alkaloids (atropine, hyoscyamine, scopolamine, etc.), etc.

Dose: 0.045 Gm. ($\frac{3}{4}$ grain).

Preparations:

Fluidextractum Belladonnæ Radicis; Dose, 0.05 mil (1 min.).
Linimentum Belladonnæ (from fluidextract).



PETROSELINI RADIX

1, Longitudinal section with recurved cortex and ridge of pith. 2, Annulate surface. 3, Transverse section showing round resin cavities.

PETROSELINI RADIX (Petrosel. Rad.) N. F.

English name: Parsley Root.

Synonyms: Garden Parsley, Common Parsley.

Botanical origin: *Petroselinum sativum* Hoffmann.
(Fam. *Umbelliferae*.)

Part used: Root.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Southern Europe; cultivated quite universally.

Description:

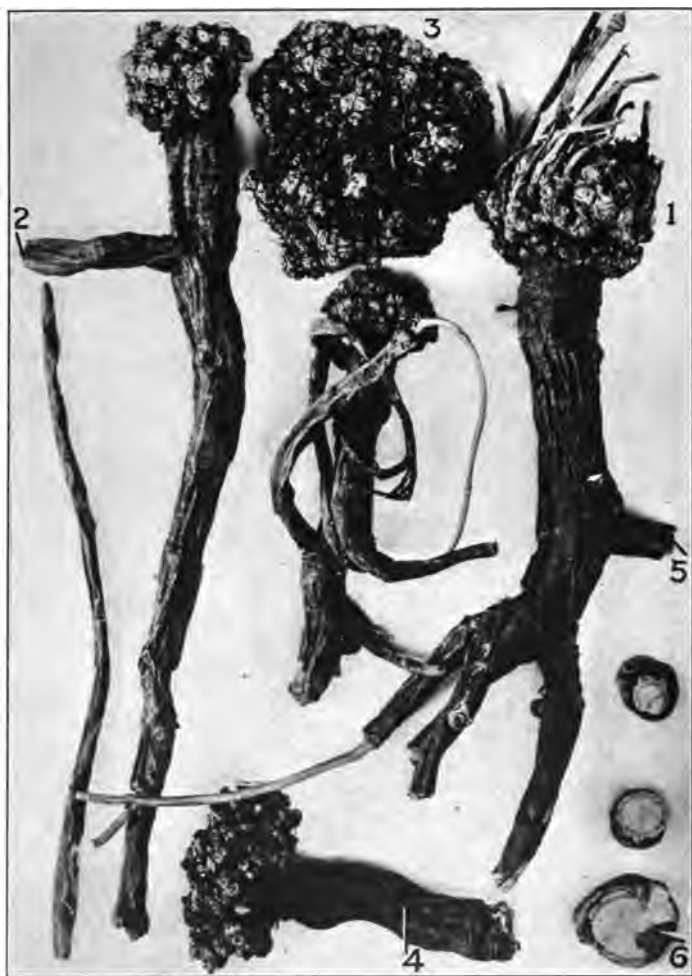
Parsley root *occurs* as entire, longitudinally cut, and as broken pieces, varying in length up to 25 cm. and in diameter up to 3 cm. The crown is cone-shaped, annulate, and scaly. The roots are mostly simple. The *texture* is non-fibrous. The *color* is light yellowish brown. The *surface* is interruptedly annulate, longitudinally wrinkled; the root scars are elevated and slightly depressed in the center. The *fracture* is very weak, brittle and uneven when dry, but pliable when moist. The *outline* varies from nearly cylindrical to very irregular. Sections of longitudinal pieces show a prominent wood portion and incurved margins of the cortex. The *cortex* is yellow brown, and it has scattered reddish brown resin cavities with resin. The *wood* is light yellowish brown with brown resin cavities. The *odor* is aromatic. The *taste* is sweet and pungent.

Constituents: Gum, starch, sugar, volatile oil, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Petroselini Radicis; Dose, 2 mls (30 min.).



SENEGA

1, Crown with numerous stem bases. 2, Branch at right angles to the main root. 3, Surface view of the crown. 4, Keel. 5, Broken root. 6, Undeveloped part of wood which is typical of senega.

SENEGA (Seneg.) U. S. P.

English name: Senega.

Synonyms: Seneca Snakeroot, Senega Snakeroot.

Botanical origin: *Polygala Senega* Linné. (Fam. *Polygalaceæ*.)

Part used: Root.

Impurities: Not more than 5 per cent. stems and other foreign matter.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Canada, Eastern United States west to Canadian Rockies and south to Arkansas and North Carolina.

Description:

Senega occurs in broken pieces, varying in length up to 29 cm. and in diameter up to 11 mm. at the crown. The crown bears generously, having often as many as 40 stem bases. The stems are of variable length, and they have numerous purple scales. The surface of the crown is purplish black. The root is usually branched and twisted, and the branches frequently grow out at right angles. On a few of the roots there is a keel, or ridge, which extends a short distance from the crown. In many of the roots the wood is exposed, owing to the removal of the cortex. The texture is resinous and woody. The color varies from brownish yellow to blackish yellow. The surface is annulate near the crown and in the region of the root branches; other parts of the surface are longitudinally wrinkled. The fracture is very weak, brittle and uneven. The outline is cylindrical and wavy. The cortex is thin and yellowish brown. The wood is light yellow, and in places undeveloped and finely porous. The odor is slight. The taste is sweet and acrid.

Constituents: Saponin, polygalic acid, senegin, resin, fat, sugar, oil (fixed and volatile), etc.

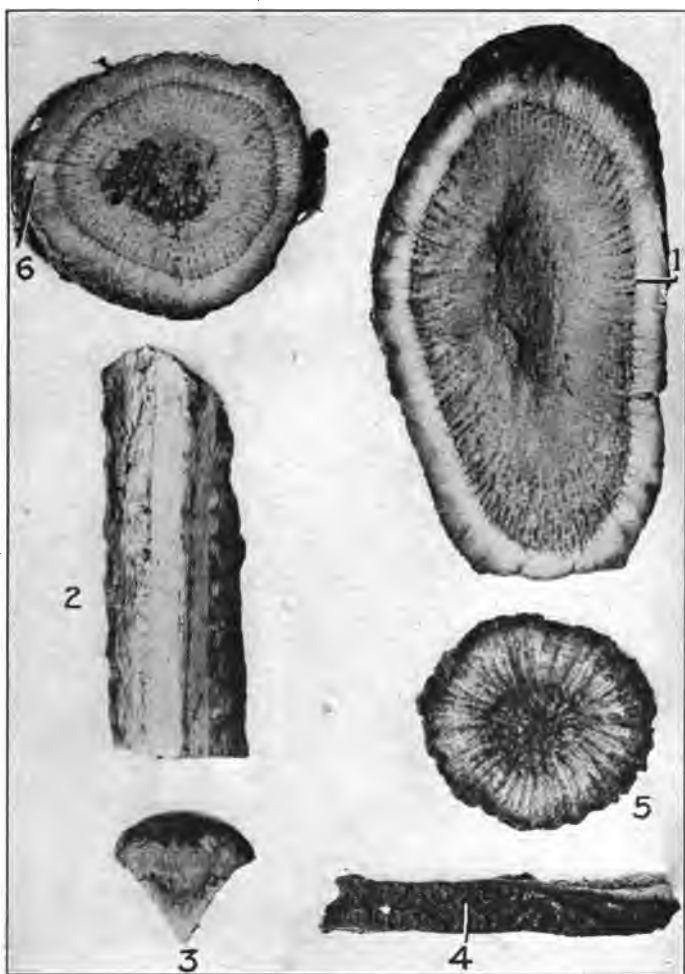
Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Senegæ; Dose, 1 mil (15 min.).

Syrupus Scillæ Compositus (from fluidextract); Dose, 2 mils (30 min.).

Syrupus Senegæ (from fluidextract); Dose, 4 mils (1 fl. dr.).



CALUMBA

1, Oblique section showing cambium zone and radiate wood. 2, Longitudinal section. 3, Transverse section of cut root. 4, Wrinkled outer surface of the root. 5, Radiate ridges common in the drug of commerce. 6, Radiate ridges common in the drug of commerce.

CALUMBA (Calumb.) U. S. P.

English name: Calumba.

Synonyms: Columba, Columbo, Colombo.

Botanical origin: *Jateorhiza palmata* (Lamarek)
Miers. (Fam. *Menispermaceæ*.)

Part used: Root.

Impurities: None given in Pharmacopœia.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Eastern Africa; also cultivated.

Description:

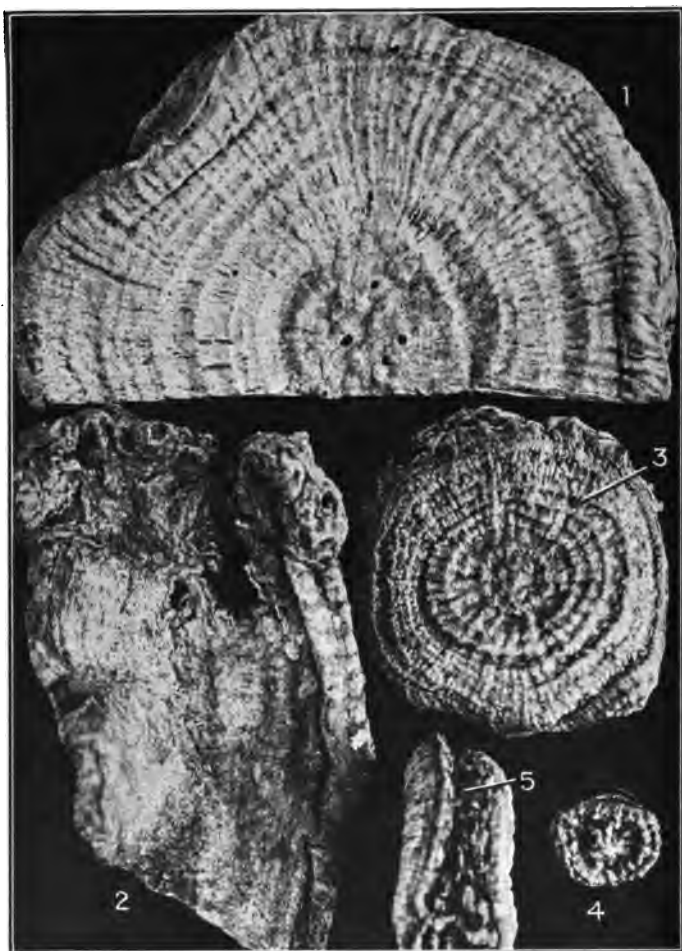
Calumba occurs as transverse, oblique, and as longitudinal slices. These sections are usually entire. They measure up to 8 cm. in diameter and up to 12 mm. in thickness. The texture is fibrous and starchy. The color is dark reddish, yellowish, or greenish brown. The surface is irregularly wrinkled. The fracture is brittle and even. The outline of the transverse slices is circular; of the oblique slices, oval; of the longitudinal slices, rectangular. The cortex is thick. The thin outermost layer is brown, and the remaining part of the cortex is greenish yellow except near the cambium ring, where it is yellowish gray. This inner layer frequently has dark radiating lines of tissue. The wood is dark yellowish green near the cambium, and has dark, interrupted lines of conducting tissue. The central portion is greenish yellow with a few scattered masses of conducting tissue. The odor is not distinct. The taste is very bitter.

Constituents: Alkaloids, starch, pectin, gum, resin, fat, volatile oil, wax, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Calumbæ N. F.; Dose, 2 mls (30 min.).
Tinctura Calumbæ; Dose, 4 mls (1 fl. dr.).



BRYONIA

1, Large transverse section. 2, Longitudinal section. 3, Section showing prominent concentric and radiate ridges. 4, Small transverse section. 5, Wrinkled surface with the cortex curved back from the cut surface.

BRYONIA (Bryon.) N. F.

English name: Bryonia.

Synonyms: Wild Bryony, Bryony Root.

Botanical origin: *Bryonia alba* Linné or *Bryonia dioica* Jacqu. (Fam. *Cucurbitaceæ*.)

Part used: Root.

Impurities: Not more than 5 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Central and Southern Europe.

Description:

Bryonia occurs as transverse, oblique, and as longitudinal slices. These pieces measure up to 11 cm. in width and up to 16 mm. in thickness. The texture is starchy. The color is grayish yellow or grayish brown. The surface is irregularly wrinkled. The fracture is very brittle and even. The outline is circular in transverse, oval in oblique, and rectangular in longitudinal sections. The cortex is thin and brownish yellow. The wood is white or yellowish white. The wood forms concentric and radiating zones. The odor is slight. The taste is bitter and nauseating.

Constituents: Starch, gum, sugar, fat, glucosides (bryonin, bryonidin), resin, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Tinctura Bryoniæ; Dose, 4 mls (1 ff. dr.).



Rhubarb in wooden case covered with yellow tissue paper painted red at the border. Inside the case is an inner tin or zinc which is hermetically sealed.

CHAPTER II

RHIZOMES

IN the study of rhizomes the following must be considered: Occurrence, size, type, nature, stem and leaf scars and bases, texture, color, surface, tenacity, fracture, outline, cortex, cambium or endodermis, wood or central cylinder, pith, odor and taste.

1. **Occurrence.** Rhizomes are entire, as in geranium; or broken, as in blue flag; or cut transversely, as in zedoaria and in galangal; or cut longitudinally, as in blue flag.

2. **Size.** The size of rhizomes varies in length from 8 cm., as in *Virginia serpentaria*, to 8.5 dm., as in some of the unbroken rhizomes of wild yam. The diameter varies from one millimeter, as in *Virginia snake-root*, to 5 cm., as in zedoaria.

3. **Type.** All the rhizomes are horizontal except trillium, which is frequently oblique.

4. **Nature.** Rhizomes are simple, as in trillium and some of the rhizomes of geranium. All the other rhizomes are branched.

5. **Stem and Leaf Scars and Bases.** Stem bases or scars of stems are diagnostic in most rhizomes. Their distinctness, size, position—whether above, even with, or below the surface of the rhizome—and their distance apart must be considered. The stem scars on the branches of all the gingers are sunken, laterally constricted; the stem scars on geranium and wild yam are indistinct. The leaf scars on Florentine orris root are distinct. American male fern consists largely of stipe bases.

6. **Texture.** The texture is resinous, as in a good quality of any of the gingers; fibrous, as in wild yam and galangal; starchy, as in geranium; oily and starchy, as in trillium.

7. **Color.** The more common colors are grays, yellows, and browns, which are combined to form the characteristic colors of the different drugs. The color of each drug is given under the description.

8. **Surface.** The surface of wild yam is nodulated; that of galangal, blue flag, orris root, the unpeeled portion of gingers and trillium is annulated; that of Jamaica ginger is smooth.

9. **Tenacity.** By tenacity is meant the resistance which a rhizome offers to tearing and pulling stresses. The six classes are as follows: Very weak brittle, weak brittle, brittle, tough, strong tough and very strong tough. Very weak brittle: There are no rhizomes which come under this class. Weak brittle: Male fern (American and European). Brittle: The brittle rhizome is blue flag. Tough: All the gingers. Strong tough: Geranium and beth root. Very strong tough: Wild yam, orris roots, and galangal belong to this class.

10. **Fracture.** The fracture is even, as in orris root; uneven, as in the gingers, etc.

11. **Outline of Transverse Sections.** The outline of most rhizomes is nearly cylindrical. In the gingers, the outline is oval.

12. **Cortex.** The cortex may be thin, as in African ginger and in geranium; thick, as in blue flag, orris roots and zedoary; very thick, as in galangal and beth root. The color of the cortex is characteristic for each drug. The markings are not distinct in the cortex of any of the rhizomes except beth root, which has many cavities formed by decayed roots.

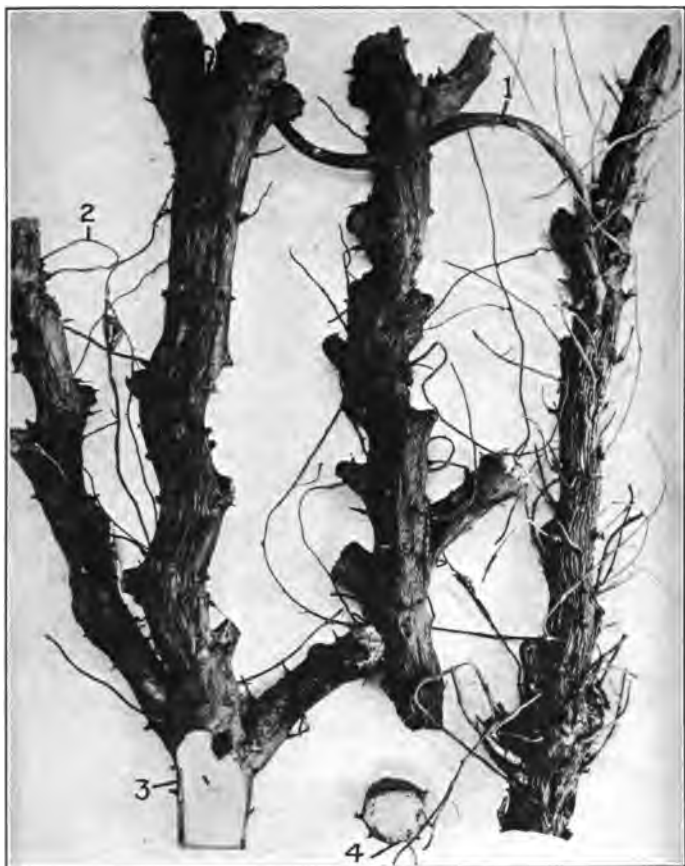
13. **Endodermis.** The endodermis is distinct in most of the rhizomes when they are freshly cut.

14. **Central Cylinder.** The central cylinder of Florentine orris root and most of the other rhizomes shows scattered bundles of conducting tissue. Zedoary has numerous dark resin cavities with resin. In wild yam and zedoary the bundles are not distinct.

15. **Pith.** The pith is not distinct in most of the rhizomes.

16. **Odor.** The gingers, orris roots, galangal and zedoary are *strongly aromatic*; beth root is *slightly aromatic*; wild yam, blue flag, geranium, and the aspidiums are not odorous.

17. **Taste.** All the gingers, orris root, zedoary and galanga are pungent; geranium is astringent; wild yam is starchy and acrid; beth root is sweet, bitter and acrid; male fern is sweet, astringent and acrid; orris roots are sweet, pungent and acrid.



DIOSCOREA

1, Portion of stem attached to the rhizome and a rhizome which is branched and nodulated. 2, Wiry slender rootlets. 3, Out woody surface. 4, Cross-section showing thin cortex.

DIOSCOREA (Diosc.) N. F.

English name: Dioscorea.

Synonyms: Wild Yam Root, Yam Root.

Botanical origin: *Dioscorea villosa* Linné. (Fam. *Dioscoreaceæ*.)

Part used: Dried rhizome.

Impurities: None given.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Canada; Eastern, Central, and Southern United States.

Description:

Wild yam occurs as broken pieces of the rhizome. The rhizomes are branched. They measure up to 70 cm. in length and up to 10 mm. in diameter. The rhizome is horizontal, and the younger part frequently bears a portion of the slender, striated, twisted stem. The texture is fibrous. The color varies from light to dark yellow. The upper surface is marked with circular, slightly depressed stem scars or with nodular projections, and has a short stem base with long and short rootlets. The under surface has nodular projections and rootlets, and, like the upper surface, it is finely striated longitudinally. The fracture is very tough and even. The outline is nearly cylindrical. The cross-section is grayish white, and shows, when magnified, yellow conducting tissue. The odor is not distinct. The taste is starchy and acrid.

Constituents: Resin, starch, saponin, etc.

Dose: 4 Gm. (1 drachm):

Preparations:

Fluidextractum Dioscoreæ; Dose, 4 mls (1 fl. dr.).



IRIS VERSICOLOR

1, Outer surface of a typical rhizome. 2, Leaf bases. 3, Transversely wrinkled roots. 4, Root scar. 5, Central cylinder showing scattered conducting tissue.

IRIS VERSICOLOR (Iris Vers.) N. F.

English name: Blue Flag.

Synonyms: Iris Root.

Botanical origin: *Iris versicolor* Linné. (Fam. *Iridaceæ*.)

Part used: Dried rhizome.

Impurities: Not more than 5 per cent. of roots and leaf bases.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Eastern North America and Central United States.

Description:

Blue flag occurs as entire rhizomes, or as longitudinal slices, or as broken pieces. The rhizomes are simple or branched, and they measure up to 15 cm. in length and up to 18 mm. in diameter. The rhizome is horizontal and no stem scars are present; the rhizome is the stem. The texture is slightly starchy and fibrous. The color varies from gray to purplish brown. The upper surface has many dark, obliquely annulate leaf scars with scattered masses of conducting tissue. The surface between the scars is wrinkled longitudinally. The under surface has numerous fine, transversely wrinkled roots or circular depressed root scars. The fracture is brittle and uneven. The outline of the sections is cylindrical or irregular. The cortex is purplish brown, thick, and finely porous. The endodermis is yellowish white, and the central cylinder is purplish and has numerous scattered yellowish masses of conducting tissue. The odor is not characteristic. The taste is sweet, astringent and acrid.

Constituents: Starch, gum, tannin, oil, sugar, resin, glucoside (iridin), etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Iridis Versicoloris; Dose, 2 mls (30 min.).



IRIS—FLORENTINE

1, Branched rhizome. 2, Root scars on the under surface. 3, Indistinct annulations. 4, Transverse section showing thick cortex. 5, Section showing conducting tissue in scattered masses.

IRIS N. F.

(1) Florentine Orris

English name: Orris.

Synonyms: Orris Root, Florentine Orris Root.

Botanical origin: *Iris florentina* Linné. (Fam. *Iridaceæ*.)

Part used: Rhizome freed from roots, and peeled and dried.

Impurities: None given.

Assay: None given.

Ash: Not less than 2 per cent. nor more than 5 per cent.

Habitat: Eastern Mediterranean region, Northern Africa; cultivated in Europe for the drug, in the United States for the flower.

Description:

Florentine orris occurs as entire or broken pieces of the completely peeled rhizome. The rhizome is simple or branched, and the branches are broad at the end but narrow at the point of origin from the main rhizome. They measure up to 12 cm. in length and up to 4 cm. in width and a maximum thickness of 2 cm. The rhizome is horizontal and free of stems or stem scars. The texture is starchy and non-fibrous. The color is whitish yellow. The upper surface is annulate with leaf scars showing the circular parallel rows of conducting tissue. The under surface has numerous circular depressed root scars or circular slightly projecting cut portions of roots. The fracture is very strong, tough and even. The outline of cross-sections is circular or oval, and has a slightly irregular edge. The cortex is thick and grayish white. The endodermis is distinct and yellowish. The central cylinder has numerous circular isolated masses of conducting tissue, which are more numerous near the endodermis. The odor is fragrant and aromatic. The taste is slightly sweet, bitter and pungent.

Constituents: Ionone, starch, resin, tannin, volatile oil, etc.

Dose: Not used therapeutically.

Preparations:

None.



IRIS—VERONA

- 1, Large rhizome showing under surface and numerous root scars. 2, Leaf bases. 3, Portion of unpeeled surface. 4, Cortex. 5, Large, frequently dark, central cylinder.

IRIS N. F.

(2) Verona Orris

English name: Orris.

Synonyms: Orris Root, Verona Orris Root.

Botanical origin: *Iris germanica* Linné, *Iris pallida* Lamarck. (Fam. *Iridaceæ*.)

Part used: Rhizome freed from roots, and peeled and dried.

Impurities: None given officially.

Assay: None given.

Ash: Not less than 2 per cent. nor more than 5 per cent.

Habitat: Eastern Mediterranean region, Northern Africa; cultivated in Europe for the drug, in the United States for the flower.

Description:

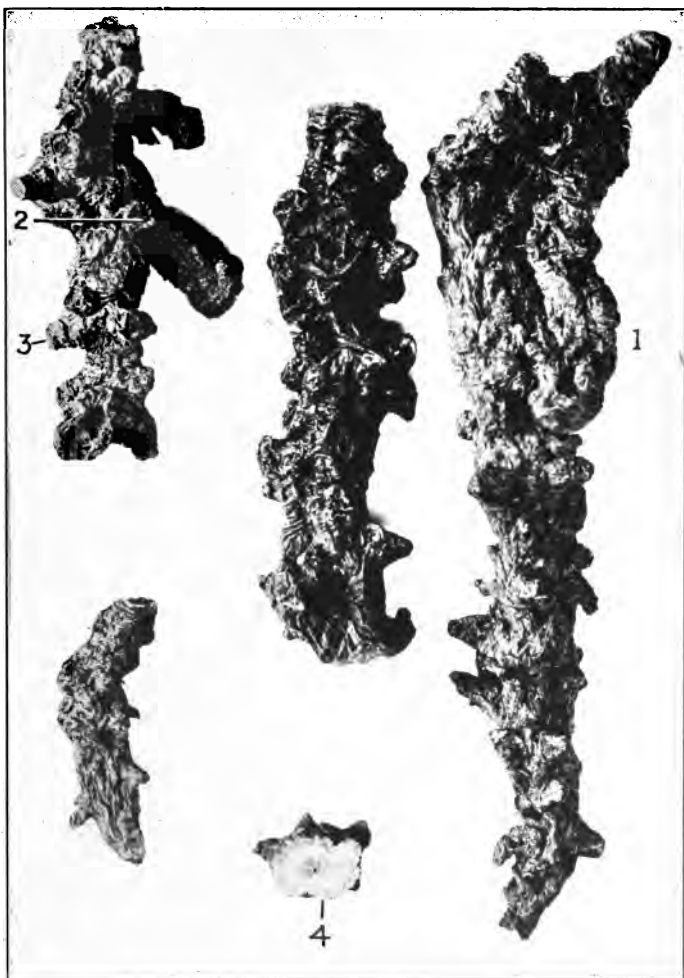
Verona orris occurs as entire or broken pieces of the partially peeled rhizome. The rhizome is branched, but the commercial drug consists largely of separated branches, or it is simple. The root measures up to 14 cm. in length and up to 3 cm. in diameter, and a maximum thickness of 15 mm. It is horizontal and free of stem bases and scars. The texture is starchy and non-fibrous. The color of the unpeeled surface is orange-yellow, that of the peeled surface grayish yellow. The upper surface is rough; this roughness is caused by careless paring. The surface has patches of orange-yellow periderm or numerous whitish concentric leaf bases. The under surface has numerous circular depressed root scars or circular, slightly projecting, cut portions of roots. The fracture is very strong, tough, and even. The outline is broadly oval and wavy. The cortex is thin and grayish white. The endodermis is distinct and yellowish, and the circular masses of conducting tissue are scattered throughout the stele, which is greenish yellow to brown. The odor is fragrant and aromatic. The taste is slightly sweet, bitter and pungent.

Constituents: Ionone, starch, resin, tannin, volatile oil, etc.

Dose: Not used therapeutically.

Preparations:

None.



GERANIUM

1, A branched rhizome with a strongly nodulated surface.
 2, Stem scar. 3, Nodule. 4, Cross-section of the rhizome.

GERANIUM (Geran.) N. F.

English name: Geranium.

Synonyms: Wild Geranium, Cranesbill.

Botanical origin: *Geranium maculatum* Linné. (Fam. Geraniaceæ.)

Part used: Dried rhizome.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Eastern and Central North America, and Middle Western United States.

Description:

Geranium rhizome occurs as a mixture of entire and broken pieces. The rhizome is simple or branched, and it measures up to 11 cm. in length and up to 15 mm in width. It is horizontal and is marked with circular, slightly depressed stem scars. The texture is starchy and waxy. The color is dark yellowish or reddish brown. The upper surface has many circular stem scars and is prominently nodulated. Between the nodules the rhizome is annulate with transverse ridges. The under surface and sides are nodulated and annulated. The fracture is strong, tough, and even. The outline is irregularly oval. The cortex is thick and purplish brown. The cambium zone is prominent and darker than the remaining portion of the surface. The wood has isolated yellowish masses of conducting tissue near the cambium. The pith makes up the greater part of the rhizome and is grayish purple. The odor is indistinct. The taste is strongly astringent.

Constituents: Tannin, gallic acid, resin, pectin, sugar, geranium red, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Geranii; Dose, 1 mil (15 min.).



ZINGIBER—JAMAICA

- 1, A typical branched peeled rhizome. 2, Small rhizome.
3, Stem scar.

ZINGIBER (Zingib.) U. S. P.

(1) Jamaica Ginger

English name: Ginger.

Synonyms: Jamaica Ginger.

Botanical origin: *Zingiber officinale* Roscoe. (Fam. *Zingiberaceæ*.)

Part used: Rhizome.

Impurities: None given in U. S. P.

Assay: Not less than 2 per cent. of a non-volatile extract soluble in ether and not less than 4 per cent. of an extract soluble in alcohol.

Ash: Not more than 8 per cent.

Habitat: Cultivated in West Indies.

Description:

Jamaica ginger occurs as a mixture of irregularly branched rhizomes and broken pieces. All surfaces are completely peeled. The rhizomes measure up to 12 cm. in length, up to 3.5 cm. in height, and up to 1 cm. in width. The rhizome is horizontal, and the ends of the branches have circular or oval sunken stem scars. The texture is starchy, resinous and fibrous. The color of all surfaces is yellowish brown. The upper surface has several branches which terminate in sunken stem scars. All the surfaces are striated longitudinally, and have a few projecting thread-like strands of conducting tissue. The under surface frequently has short, undeveloped branches, or longer branches which normally continue the growth of the rhizome. The fracture is brittle and uneven. The outline is oval. This is caused by lateral compression. The cortex is thin. The endodermis is yellowish and encloses the large stele; it has scattered masses of conducting tissue and resin cavities with resin. The color is light yellow. The odor is strongly aromatic and pungent.

Constituents: Volatile oil, starch, gum, fat, acrid resin, gingerol, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Aromaticum (from aromatic powder); Dose, 1 mil (15 min.).

Fluidextractum Zingiberis; Dose, 1 mil (15 min.).

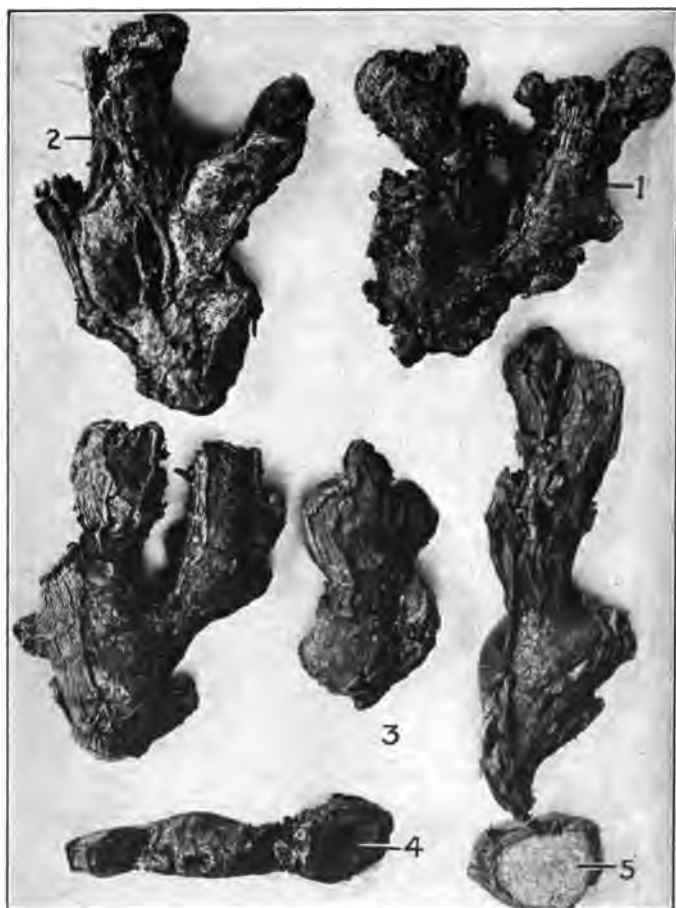
Oleo-resina Zingiberis; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).

Pulvis Aromaticus; Dose, 1 Gm. (15 grains).

Pulvis Rhei Compositus; Dose, 2 Gm. (30 grains).

Syrupus Zingiberis (from fluidextract); Dose, 15 mils (4 fl. dr.).

Tinctura Zingiberis; Dose, 2 mils (30 min.).



ZINGIBER—AFRICAN

- 1, A branched rhizome. 2, Unpeeled portion of the rhizome. 3, Small rhizome. 4, Stem scar. 5, Cross-section showing small resin cells.

ZINGIBER (Zingib.) U. S. P.

(2) African Ginger

English name: Ginger.

Synonyms: African Ginger.

Botanical origin: *Zingiber officinale* Roscoe. (Fam. *Zingiberaceæ*.)

Part used: Rhizome.

Impurities: None given in Pharmacopœia.

Assay: Not less than 2 per cent. of a non-volatile extract soluble in ether, and not less than 4 per cent. of an extract soluble in alcohol.

Ash: Not more than 8 per cent.

Habitat: Cultivated in tropical Africa.

Description:

African ginger occurs as a mixture of irregular, branched, entire rhizomes, and as broken pieces. The flat surfaces are mostly peeled. The rhizomes measure up to 9 cm. in length, up to 2.5 cm. in height and up to 1.5 cm. in width. The rhizome is horizontal, and the ends of the branches have circular or oval sunken stem scars. The texture is starchy and fibrous. The color of the uncut surface is dark grayish brown, that of the cut surface brownish black. The upper surface has many short and long branches with prominent terminal stem scars with cork. The under surface, which frequently has branches which in turn branch, has patches of cork. The fracture is brittle and uneven. The outline is nearly circular or broadly oval. The cortex is thin and yellowish brown. The endodermis is dark brown. The stele is large and has numerous separated masses of conducting cells and reddish resin cells with resin. The odor is aromatic and pungent.

Constituents: Volatile oil, starch, gum, fat, acrid resin, gingerol, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Aromaticum (from aromatic powder); Dose, 1 mil (15 min.).

Fluidextractum Zingiberis; Dose, 1 mil (15 min.).

Oleoresina Zingiberis; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).

Pulvis Aromaticus; Dose, 1 Gm. (15 grains).

Pulvis Rhei Compositus; Dose, 2 Gm. (30 grains).

Syrupus Zingiberis (from fluidextract); Dose, 15 mls (4 fl. drs.).

Tinctura Zingiberis; Dose, 2 mls (80 min.).



ZINGIBER—CALICUT

- 1, A large branched rhizome. 2, Broad type of rhizome.
- 3, Stem scar. 4, Small rhizome. 5, Cross-section of rhizome showing resin cells.

ZINGIBER (Zingib.) U. S. P.

(3) Calcutta Ginger

English name: Ginger.

Synonyms: Calcutta Ginger, Race Ginger.

Botanical origin: *Zingiber officinale* Roscoe. (Fam. *Zingiberaceæ*.)

Part used: Rhizome.

Impurities: None given officially.

Assay: Not less than 2 per cent. of a non-volatile extract soluble in ether and not less than 4 per cent. of an extract soluble in alcohol.

Ash: Not more than 8 per cent.

Habitat: Cultivated in India.

Description:

Calcutta ginger occurs as irregular, branched, entire rhizomes, and as broken pieces. The flat surfaces are partially or completely peeled. The rhizomes measure up to 7 cm. in length, to 3 cm. in height and to 1.5 cm. in width. The rhizome is horizontal, and the ends of the branches have circular or oval sunken stem scars. The texture is starchy, resinous and fibrous. The color of the uncut surface is grayish brown, that of the cut surface bluish. The upper surface has many short and long branches with prominent terminal sunken stem scars. The under surface has several long, incompletely developed branches with cork. The fracture is brittle and uneven. The outline is broadly oval. The cortex is thin and darker than the remaining part of the rhizome. The endodermis is yellowish. The stele is large and has numerous separated masses of conducting cells, and resin cavities with resin. The odor is aromatic. The taste is strongly aromatic and pungent.

Constituents: Volatile oil, starch, gum, fat, acrid resin, gingerol, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Aromaticum (from aromatic powder); Dose, 1 mil (15 min.).

Fluidextractum Zingiberis; Dose, 1 mil (15 min.).

Oleoresina Zingiberis; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).

Pulvis Aromaticus; Dose, 1 Gm. (15 grains).

Pulvis Rhei Compositus; Dose, 2 Gm. (30 grains).

Syrupus Zingiberis (from fluidextract); Dose, 15 mls (4 fl. drs.).

Tinctura Zingiberis; Dose, 2 mls (30 min.).



ZINGIBER—CALCUTTA

1, Branched rhizome. 2, Unbranched rhizome. 3, Annulate leaf scar. 4, Transverse section showing resin cells. 5, Stem scar.

ZINGIBER (Zingib.) U. S. P.

(4) Calicut Ginger

English name: Ginger.

Synonyms: Calicut Ginger, Lemon Ginger.

Botanical origin: *Zingiber officinale* Roscoe. (Fam. *Zingiberaceæ*.)

Part used: Rhizome.

Impurities: None given in Pharmacopœia.

Assay: Not less than 2 per cent. of a non-volatile extract soluble in ether and not less than 4 per cent. of an extract soluble in alcohol.

Ash: Not more than 8 per cent.

Habitat: Cultivated on west coast of Africa.

Description:

Calicut ginger occurs as irregular, branched, entire rhizomes, and as broken pieces. The flat surfaces are mostly peeled. The rhizomes measure up to 8 cm. in length, to 2.8 cm. in height and to 13 mm. in width. The rhizome is horizontal, and the ends of the branches have circular or oval sunken stem scars. The texture is starchy and fibrous. The color of the uncut surface is dark yellow, orange, or reddish brown; of the cut surface, grayish brown. The upper surface has short and long branches with prominent sunken stem scars. The under surface has many undeveloped branches with cork patches. The fracture is brittle and uneven. The outline varies from oval to circular. The cortex is thin. The endodermis is indistinct. The stele is large and has large scattered masses of brownish conducting strands and small yellow resin cavities with resin. The odor is aromatic. The taste is strongly aromatic and pungent.

Constituents: Volatile oil, starch, gum, fat, acrid resin, gingerol, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Aromaticum (from aromatic powder); Dose, 1 mil (15 min.).

Fluidextractum Zingiberis; Dose, 1 mil (15 min.).

Oleoresina Zingiberis; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).

Pulvis Aromaticus; Dose, 1 Gm. (15 grains).

Pulvis Rhei Compositus; Dose, 2 Gm. (30 grains).

Syrupus Zingiberis (from fluidextract); Dose, 15 mls (4 fl. drs.).

Tinctura Zingiberis; Dose, 2 mls (30 min.).



ZINGIBER—COCHIN

1, Branched rhizome. 2, Large branch. 3, Cross-section of rhizome showing resin cells. 4, Stem scar.

ZINGIBER (Zingib.) U. S. P.

(5) Cochin Ginger

English name: Ginger.

Synonyms: Cochin Ginger.

Botanical origin: *Zingiber officinale* Roscoe. (Fam. *Zingiberaceæ*.)

Part used: Rhizome.

Impurities: None given in U. S. P.

Assay: Not less than 2 per cent. of a non-volatile extract soluble in ether and not less than 4 per cent. of an extract soluble in alcohol.

Ash: Not more than 8 per cent.

Habitat: Cultivated in China.

Description:

Chinese ginger occurs as a mixture of irregular, branched, entire rhizomes, and as broken pieces. The flat surfaces are partially or completely peeled. The rhizomes measure up to 6.7 cm. in length, to 3.5 cm. in height and to 12 mm. in diameter. The rhizome is horizontal; the ends of the branches have circular or oval sunken stem scars. The texture is starchy and fibrous. The color of the uncut surface is light gray or yellowish brown; of the cut surface, light grayish yellow. The upper surface has long and short branches with sunken stem scars and patches of cork. The under surface has branches of variable length with cork patches. The fracture is brittle and uneven. The outline is broadly oval. The cortex is thin. The endodermis is light brown. The stele is large and has numerous separated strands of conducting tissue and yellow resin cavities with resin. The odor is aromatic. The taste is strongly aromatic and pungent.

Constituents: Volatile oil, starch, gum, fat, acrid resin, gingerol, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Aromaticum (from aromatic powder); Dose, 1 mil (15 min.).
Fluidextractum Zingiberis; Dose, 1 mil (15 min.).
Oleoresina Zingiberis; Dose, 0.03 Gm. ($\frac{1}{4}$ grain).
Pulvis Aromaticus; Dose, 1 Gm. (15 grains).
Pulvis Rhei Compositus; Dose, 2 Gm. (30 grains).
Syrupus Zingiberis (from fluidextract); Dose, 15 mls (4 fl. drs.).
Tinctura Zingiberis; Dose, 2 mls (30 min.).



ZINGIBER—JAPANESE

1, Large branched rhizome. 2, Simple rhizome. 3, Small rhizome. 4, Stem scar. 5, Section showing resin cells.

ZINGIBER (Zingib.) U. S. P.

(6) Japanese Ginger

English name: Ginger.

Synonyms: Japanese Ginger.

Botanical origin: *Zingiber officinale* Roscoe. (Fam. *Zingiberaceæ*.)

Part used: Rhizome.

Impurities: None given officially.

Assay: Not less than 2 per cent. of a non-volatile extract soluble in ether and not less than 4 per cent. of an extract soluble in alcohol.

Ash: Not more than 8 per cent.

Habitat: Cultivated in Japan.

Description:

Japanese ginger occurs as a mixture of irregular, branched, entire rhizomes, and of broken pieces. The flat surfaces are usually completely peeled. The rhizome measures up to 7 cm. in length, to 2.8 cm. in height and to 12 mm. in width. It is horizontal, and the ends of the branches have circular or oval sunken stem scars. The texture is starchy and fibrous. The color of the uncut and cut surfaces is grayish white, owing to a thin coating of lime. The upper surface has short, broad branches with a terminal constricted stem scar and with patches of cork. The under surface has short or long branches with adhering cork. The fracture is brittle and uneven. The outline is broadly oval. The cortex is thick. The endodermis is dark brown. The stele is large and has numerous very small separated masses of conducting cells and yellowish resin cavities with resin. The odor is aromatic. The taste is strongly aromatic and pungent.

Constituents: Volatile oil, starch, gum, fat, acrid resin, gingerol, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Aromaticum (from aromatic powder); Dose, 1 mil (15 min.).

Fluidextractum Zingiberis; Dose, 1 mil (15 min.).

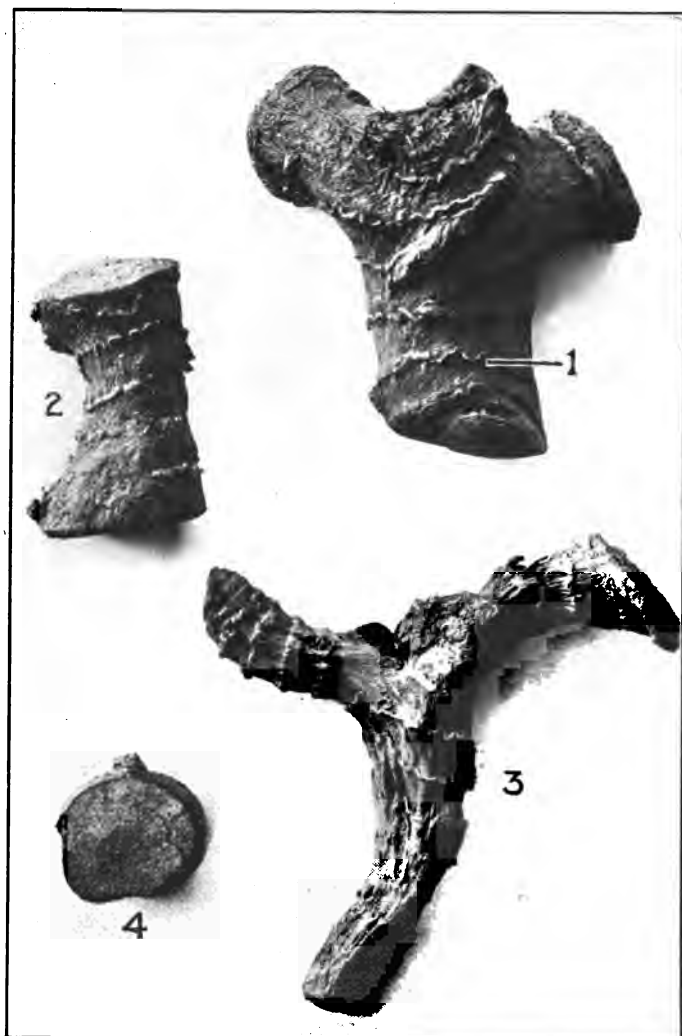
Oleoresina Zingiberis; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).

Pulvis Aromaticus; Dose, 1 Gm. (15 grains).

Pulvis Rhei Compositus; Dose, 2 Gm. (30 grains).

Syrupus Zingiberis (from fluidextract); Dose, 15 mls (4 fl. drs.).

Tinctura Zingiberis; Dose, 2 mls (30 min.).



GALANGA

1, Annulate, wavy leaf bases or scars. 2, Simple rhizome. 3, Branched rhizome. 4, Transverse section of rhizome showing scattered circular conducting strands.

GALANGA (Galang.) N. F.

English name: Galanga.

Synonyms: Galangal, East India Root.

Botanical origin: *Alpinia officinarum* Hance (Fam. *Zingiberaceæ*.)

Part used: Dried rhizome.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: China; cultivated in Asia.

Description:

Galanga rhizome occurs as long, transverse pieces. The rhizome is branched. The branches may be separated. They measure up to 11.5 cm. in length and to 2 cm. in diameter. The rhizome is horizontal. The texture is fibrous. The color is dark reddish or cinnamon brown. The surface is annulate with numerous light yellow, wavy leaf bases. The fracture is strong, tough and uneven. The outline is irregularly circular. The diameter of the cut ends is greater than the central portion. This is caused by the tissues bending outward. The cortex is thick and has no distinctive markings. The endodermis is indistinct and encloses a large stele with scattered masses of conducting tissue. The odor is aromatic. The taste is aromatic and pungent, resembling pepper.

Constituents: Volatile oil, resin, gum, starch, fixed oil, crystalline principles, etc.

Dose: 1 Gm. (15 grains).

Preparations:
None.



ZEDOARIA

1, Large transverse section of the rhizome. 2, Longitudinal section of the rhizome. 3, Top of the rhizome showing concentric leaf scars. 4, Cross-section showing sunken tissue inside endodermis. 5, Projecting woody conducting strands. 6, Wrinkled outer surface of the rhizome.

ZEDOARIA (Zedoary.) N. F.

English name: Zedoary.

Synonyms: Zedoary Root.

Botanical origin: *Curcuma Zedoaria* (Bergius) Roscoe. (Fam. *Zingiberaceæ*.)

Part used: Dried rhizome.

Impurities: None given.

Assay: None given.

Ash: 7 per cent. or less.

Habitat: East Indies.

Description: •

Zedoary occurs as a mixture of transverse and longitudinal slices of the rhizome. The slices measure up to 5 cm. in diameter and to 15 mm. in thickness. The rhizome is vertical. The texture is resinous and starchy. The color of the uncut surface is yellowish or reddish brown. The edge (uncut surface) of the slices is wrinkled and has several root scars, from the center of which project short woody conducting strands. The fracture is brittle and even. The cortex is thick and grayish yellow, and it has scattered brown resin cavities with resin. The endodermis is yellowish white, on either side of which the tissues are dark. The stele is grayish brown, and it has great numbers of brown resin cavities with resin. The odor is aromatic and is suggestive of camphor. The taste is pungent and bitter.

Constituents: Starch, gum, bitter extractive, resin, volatile oil, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Tinctura Zedoariæ Amara N. F.; Dose, 4 mls (1 fl. dr.).



ASPIDIUM—AMERICAN

- 1, Large rhizome with stipe bases, roots and scales. 2, Cross-section of stipe base showing conducting strands. 3, Worthless upper part of stipe. 4, Stipe bases separated from the rhizome.

ASPIDIUM (Aspid.) U. S. P.

(1) American Aspidium

English name: Aspidium.

Synonyms: American Male Fern.

Botanical origin: *Dryopteris marginalis* (Linné) Asa Gray. (Fam. *Polypodiaceæ*.)

Part used: Rhizome and stipes.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Most of North America.

Description:

American male fern *occurs* as entire rhizomes with attached stipes, scales and roots. The rhizomes measure up to 10 cm. in length, to 6 cm. in width and to 7 cm. in height. The rhizome is horizontal and is simple. The stipe bases are curved and scaly below. The *texture* is soft and slightly fibrous. The *color* is brownish black. The *surface* of stipes is longitudinally wrinkled but smooth. The *roots* are brownish black and wiry. The *scales* are dark brown. The *fracture* of the stipes and rhizomes is weak, brittle and even. The *outline* of the stipes is oval, that of the rhizome irregular. Cross-sections have up to 12 yellowish strands of conducting tissue arranged in a circle near the epidermis. The *odor* is indistinct. The *taste* is sweet, astringent and acrid.

Constituents: Filicic acid, volatile oil, bitter principles, starch, wax, resin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Oleoresina Aspidii; Dose, 2 Gm. (30 grains).



ASPIDIUM—EUROPEAN

1, Outer part of rhizome showing stipe scars. 2, Longitudinal section of the rhizome showing the conducting strands. 3, Curved and furrowed stipe base. 4, Cross-section of rhizome.

ASPIDIUM (Aspid.) U. S. P.

(2) European Aspidium

English name: Aspidium.

Synonyms: European Male Fern.

Botanical origin: *Dryopteris Filix-mas* (Linné)
Schott. (Fam. *Polypodiaceæ*.)

Part used: Rhizome and stipes.

Impurities: None given.

Assay: None given.

Ash: None given.

Habitat: Europe, Asia and Northern Africa.

Description:

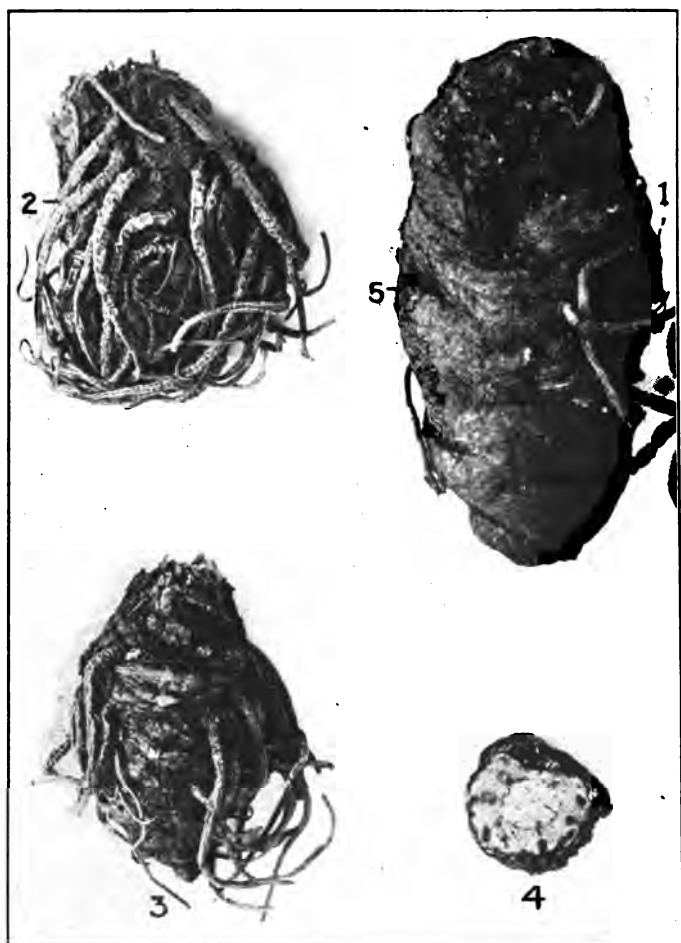
European male fern occurs as the partially peeled stipes and rhizomes and, rarely, as the entire rhizome. The stipes measure up to 6 cm. in length and to 9 cm. in length in diameter. The rhizome measures up to 15 cm. in length and to 3.5 mm. in diameter. The rhizome is simple and has numerous curved, persistent stem bases, and numerous roots and scales. The stem bases are prominent and have a great number of rusty brown scales. The outer part is black and decayed. The texture of the peeled stipes is fleshy; that of the rhizome, fleshy and fibrous. The color of the unpeeled stipes is brownish black, that of the peeled stipes brownish yellow. The color of the rhizomes varies from brownish yellow to brownish black. The surface of the stipes is longitudinally furrowed and has patches of brownish black periderm. The outer surface of the rhizomes has numerous broken stipe bases surrounded by semicircular brown colored depressions. The cut surface of the rhizomes has long-branching yellowish strands of conducting tissue. The fracture of the stipes and rhizomes is very weak, brittle, and even. The outline of the sections is irregular. The sections show a reddish brown outer region, a central region with up to 12 yellow conducting strands arranged in a circle, and an inner reddish-brown portion, which is distinctly porous when magnified. The odor is not characteristic. The taste is sweet, astringent and acrid.

Constituents: Filicic acid, volatile oil, bitter principles, starch, wax, resin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Oleoresina Aspidii; Dose, 2 Gm. (30 grains).



TRILLIUM

1, Large rhizome with numerous stem scars. 2, Small rhizome with roots. 3, Small horizontal rhizome. 4, Cross-section showing the thick cortex with cavities caused by decaying roots. 5, Stem scar.

TRILLIUM (Trill.) N. F.

English name: Trillium.

Synonyms: Beth Root, Wake-Robin.

Botanical origin: *Trillium erectum* Linné and closely allied species of *Trillium*. (Fam. *Liliaceæ*.)

Part used: Dried rhizome.

Impurities: None given.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Eastern and Central North America.

Description:

Trillium occurs as a mixture of entire and cut sections of the rhizome and roots. The rhizomes measure up to 6 cm. in width. The young rhizomes are horizontal; the older rhizomes are oblique or horizontal; both are simple. They have a maximum length of 6 cm. and a maximum diameter of 3 cm. The older rhizomes have large, depressed stem scars. The *texture* is oily and starchy. The *color* varies from light yellow to dark reddish brown. The *surface* has numerous light yellow transversely wrinkled roots. The rhizome has slightly annulate leaf scars and numerous large depressed, elongated stem scars. The rhizome is usually terminated by an undeveloped stem bud and by numerous scales. The *fracture* is brittle and even. The *cortex* is thick and has numerous root scars. The *endodermis* is distinct and dark greenish brown. There are no distinctive markings within the endodermis. The *color* of the surface is greenish yellow. The *odor* is slight, like rancid oil, not characteristic. The *taste* is sweet, bitter or acrid.

Constituents: Saponin (trillin), resin, fixed oil, starch, tannin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Trillii; Dose, 2 mls (30 min.).



Bags of different shapes and sizes. At right, a bag of parsley root on top of fennel seed. At left, canary seed in striped bag, licorice cuttings in tall bag (rear).

CHAPTER III

RHIZOMES AND ROOTS

IN the study of rhizomes and roots the following must be considered: Occurrence, size, type, nature, stem and leaf scars and bases, texture, color, surface, tenacity, fracture, outline, cortex, cambium or endodermis, wood or central cylinder, pith, odor and taste.

1. **Occurrence.** Roots and rhizomes occur in the entire condition, as in helonias; or broken, as in mandrake; or cut, as in sumbul.

2. **Size.** The length of rhizomes varies from 15 mm., as in geranium, to 8.5 dm., as in gentian. The diameter varies from 2 mm., as in Virginia serpentaria, up to 12.2 cm., as in sumbul. The roots of lady-slipper, unicorn root and helonias are usually less than 1 mm. in diameter.

3. **Type.** The rhizomes of gentian, taraxacum, veratrum, etc., are vertical; those of mandrake, asarum and many others are horizontal; helonias, aralia and pimpinella are oblique. The *type* is always given in the description.

4. **Nature.** The root and rhizome may be simple or branched. Helonias is a simple rhizome; spigelia is a branched rhizome.

5. **Stem and Leaf Scars and Bases.** The stem scars of pink root are very small and contiguous; in mandrake and blue cohosh they are larger; in spikenard root they are very large. **Stem bases.** Short stem bases occur in leptandra; long stem bases occur in black cohosh, hydrastis, and blue cohosh. In dandelion and in senega the stem bases form a multiple crown.

Leaf Bases and Leaves. Leaf bases are diagnostic in veratrum, gentian, European angelica, dandelion,

convallaria, helonias, and young rhizomes of unicorn root. Leaves occur in both Virginia and Texas snake-root.

6. **Texture.** The texture of berberis, gelsemium, hydrangea, Russian and Spanish licorice roots, and echinacea is *fibrous* and *woody*; gentian is *non-fibrous*; inula is *resinous*, etc.

7. **Color.** Shades of gray, yellow, brown, red, are common in roots and rhizomes. Each drug has a normal color variation, which is a criterion of quality.

8. **Surface.** The surface of the rhizome portion of the vertical roots and rhizomes is annulate, as in American angelica. Prominent rings also occur on the black cohosh and on mandrake and helonias. It will be seen by referring to the plates that the rings may be contiguous, as in helonias, or separated by considerable space, as in black cohosh.

9. **Tenacity.** The tenacity or resistance to breaking varies in the different roots and rhizomes. According to the resistance which they offer, they are divided into classes as follows: Very weak brittle, weak brittle, brittle, tough, strong tough, and very strong tough roots and rhizomes. Very weak brittle: Texas and Virginia snakeroot, pink root, asarum, hydrastis, valerian, cypripedium, the angelicas, and senega. Weak brittle: Mandrake, parsley, pimpinella, and the male ferns. Brittle: Apocynum, dandelion, and gentian; dandelion and gentian, if moist, are pliable. Tough: Stillingia. Strong tough: Marsh-mallow, the licorice roots, leptandra, echinacea and valerian rhizome. Very strong tough: Wild yam, sumbul, phytolacca, inula and kava.

The following cannot be broken by the ordinary means: Rhubarb, berberis, gelsemium, hydrangea, convallaria, spikenard, triticum and the roots of caulophyllum, aletris and helonias.

10. **Fracture.** The fracture of apocynum is *even*; of leptandra *uneven*; of hydrangea *hackly*.

11. **Outline.** The outline of the roots and rhizomes is usually irregularly cylindrical.

12. **Cortex.** The cortex is thin, as in berberis; thicker, as in apocynum; or several times thicker than the wood (exception), as in dandelion. The color of the cortex is fairly uniform and diagnostic for each drug. The markings of the cortex are indistinct in some drugs, distinct in others. The cortex of American angelica and Spanish licorice is finely radiate; dandelion has concentric latex zones; German angelica has large oleoresin cavities.

13. **Cambium.** The cambium zone is usually distinct in most drugs.

14. **Wood.** The wood of berberis is concentric and radiate; of gelsemium, echinacea and kava, radiate; apocynum has large pores; German angelica is radiate near the cambium; mandrake has an interrupted circle of yellow conducting tissue; rhubarb is mottled.

15. **Pith.** The pith is prominent in a number of drugs. In berberis it is dark brown and small; in angelica it is large and frequently layered; in triticum the pith is hollow. •

16. **Odor.** Many of the drugs have diagnostic odors, others are odorless. It should be remembered that odor is a criterion of quality.

17. **Taste.** The taste of the different drugs varies considerably. A few of the drugs have simple tastes (one). Russian and Spanish licorice and triticum are sweet; berberis, gelsemium, hydrastis and helonias are bitter; asarum is pungent. In the remaining roots and rhizomes two or more tastes are experienced as indicated under the description of each drug.



BERBERIS

- 1, Large root with a split branch. 2, Longitudinal section showing small pith and patches of medullary rays. 3, Concentric rings of wood. 4, Radiating medullary rays. 5, Thin cortex.

BERBERIS (Berber.) N. F.

English name: Berberis.

Synonyms: Oregon Grape Root, Trailing Mahonia.

Botanical origin: Species of *Odostemon* Rafinesque of the genus *Berberis* Linné. (Fam. *Berberidaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of the over-ground parts of the plant or other foreign matter. Berberis without the bark should be rejected.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Mountainous regions of North and South America.

Description:

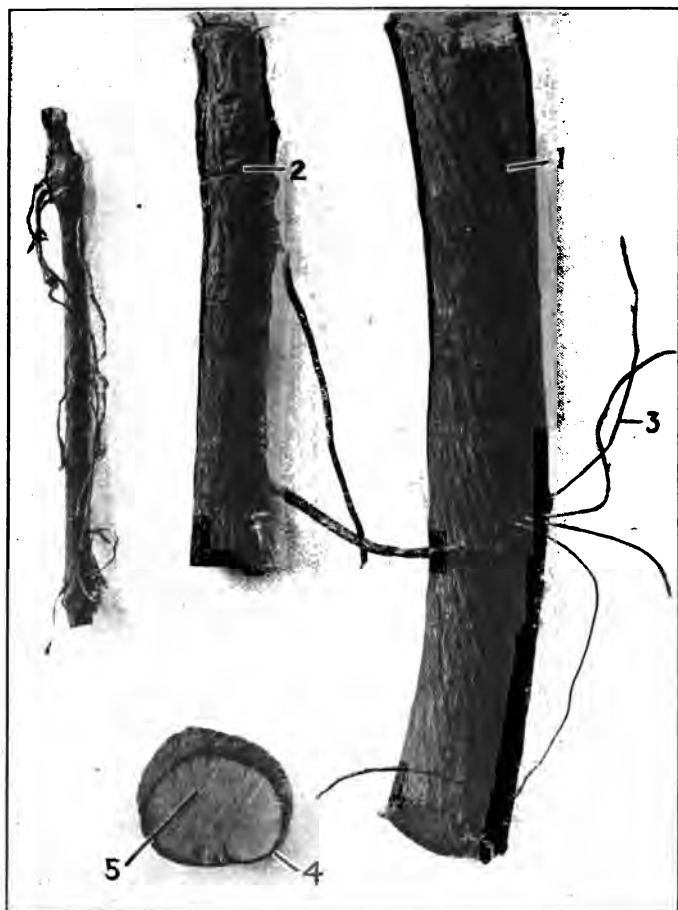
Berberis occurs as broken and as long transversely cut pieces of the rhizome and roots. Their length is variable and they measure up to 5 cm. in diameter. The sections of the roots are simple or branched. The texture is fibrous. The color varies from light yellow to dark yellowish brown. The surface is rough. This roughness is caused by small, irregular fissures of the periderm. The fracture is very strong, tough, and hackly. The outline of the cross-sections is nearly cylindrical. The cortex is thin and brownish green. The wood is concentric and is divided into small zones by the numerous radial medullary rays. In longitudinal sections of the root the medullary rays form broad, dark-colored bands. The pith is central or eccentric and is very small and greenish brown. The odor is not characteristic. The taste is bitter.

Constituents: Gum, fat, resin, tannin, alkaloids (berberine, oxycanthine, etc.), etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Berberidis; Dose, 2 mls (30 min.).



GELSEMIUM

1, A twisted, split (at 1) and striated root. 2, Small fissure beginning at root scar. 3, Small wiry roots. 4, Thin cortex. 5, Thick, finely radiate wood.

GELSEMIUM (Gelsem.) U. S. P.

English name: Gelsemium.

Synonyms: Yellow Jasmine Root, Evening Trumpet Flower.

Botanical origin: *Gelsemium sempervirens* (Linné)
Aiton filius. (Fam. *Loganiaceæ*.)

Part used: Rhizome and roots.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Eastern United States from Virginia to Florida and west to Texas; Mexico and Central America.

Description:

Gelsemium occurs as a mixture of long transverse or oblique sections of the rhizome and roots. These sections measure up to 30 cm. in length and up to 35 mm. in diameter. The sections are frequently spirally twisted and usually simple. The texture is fibrous. The color varies from light yellowish brown to purple. The surface of the rhizome is longitudinally striated and transversely fissured, or occasionally split near the cut ends. The surface of the roots, which are small and wiry, is nearly smooth. The fracture is very strong, tough and hackly. The outline of cross-sections is nearly cylindrical or oval. The cortex is thin and purplish brown. The wood is indistinctly concentric and porous when magnified, and it is divided into narrow zones by radial medullary rays. The pith is very small and brown. The odor is not characteristic. The taste is bitter.

Constituents: Volatile oil, resin, acid, alkaloids (gelsemine, gelseminine), etc.

Dose: 0.03 Gm. ($\frac{1}{2}$ grain).

Preparations:

Extractum Gelsemii; Dose, 0.01 Gm. ($\frac{1}{6}$ grain).

Fluidextractum Gelsemii; Dose, 0.03 mil ($\frac{1}{2}$ min.).

Tinctura Gelsemii; Dose, 0.25 mil (4 min.).



HYDRANGEA

1, Woody knotted crown. 2, Cut surface of wood. 3, Fine roots.

HYDRANGEA (Hydrang.) N. F.

English name: Hydrangea.

Synonyms: Seven-barks, Wild Hydrangea.

Botanical origin: *Hydrangea arborescens* Linné.
(Fam. *Saxifragaceæ*.)

Part used: Rhizome and roots.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 3 per cent.

Habitat: Southeastern United States, from New York to Florida and west to Louisiana.

Description:

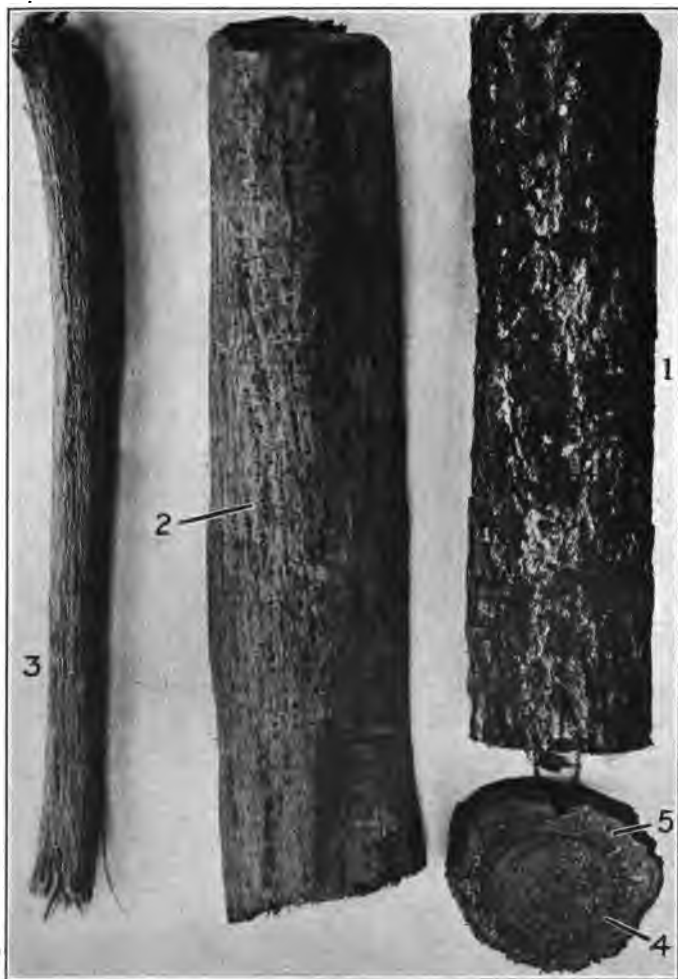
Hydrangea occurs as a mixture of the entire rhizome and roots and as broken pieces. The crown measures up to 6 cm. in diameter; the roots to 3 dm. in length and to 3 cm. in diameter. The crown is usually multiple, and the stem bases are woody, hollow and pinkish. The stem scars are circular and depressed. The crown is compound; the stem bases have a thin, easily separated cortex. The wood usually splits longitudinally and has a white pith. The texture is fibrous. The color varies from light yellow to pinkish or reddish brown. The surface of the crown is gnarled and rough. The tortuous roots are longitudinally striated and have root scars or broken fibrous roots. The fracture is very strong, tough, and hackly. The outline of the cross-sections is nearly cylindrical. The cortex is thin and pinkish brown. The wood is fibrous, finely radiate and nearly white. The odor is not distinct. The taste is slightly sweet, bitter and acrid.

Constituents: Fat, resin, starch, fixed and volatile oil, glucoside (hydrangin), etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Hydrangæ; Dose, 2 mls (30 min.).



GLYCYRRHIZA—RUSSIAN

1, Unpeeled root with gray and reddish-brown patches of cork. 2, Peeled root with small fissures. 3, Small peeled root. 4, Wood. 5, Thick cortex.

GLYCYRRHIZA (Glycyrrh.) U. S. P.

(1) Russian Glycyrrhiza

English name: Glycyrrhiza.

Synonyms: Licorice, Liquorice Root, Russian Licorice.

Botanical origin: *Glycyrrhiza glabra glandulifera*
Regel et Herder. (Fam. Leguminosæ.)

Part used: Rhizome and roots.

Impurities: None given in Pharmacopœia.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Russia, Hungary.

Description:

Russian glycyrrhiza occurs as the entire and broken peeled or unpeeled roots, or cut pieces. The roots measure up to 6 dm. in length and to 6 cm. in diameter. Stem bases are never present. The roots are usually simple and tapering. The texture is soft fibrous. The color of the peeled roots is greenish yellow; that of the unpeeled roots, brownish red. The surface of the peeled roots is smooth or rough and has transverse clefts; the surface of the unpeeled roots is rough and wrinkled, and it has many elevated lenticels. The fracture is tough and uneven. The outline of the cross-section is nearly cylindrical. The cortex is thick, radially cleft and radiate. The cambium zone is distinct. The wood is yellowish green and radiate. The pith is small and inconspicuous. The odor is slightly aromatic. The taste is sweet.

Constituents: Glycyrrhizin, volatile oil, asparagin, resin, sugar, yellow coloring matter, bitter principle, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Elixir Glycyrrhizæ (from Fluidextract).

Elixir Glycyrrhizæ Aquosum N. F.; Dose, 8 mls (2 fl. drs.).

Elixir Glycyrrhizæ Aromaticum N. F.; Dose, 8 mls (2 fl. drs.).

Fluidglyceratum Glycyrrhizæ N. F.; Dose, 2 mls (30 min.).

Extractum Glycyrrhizæ.

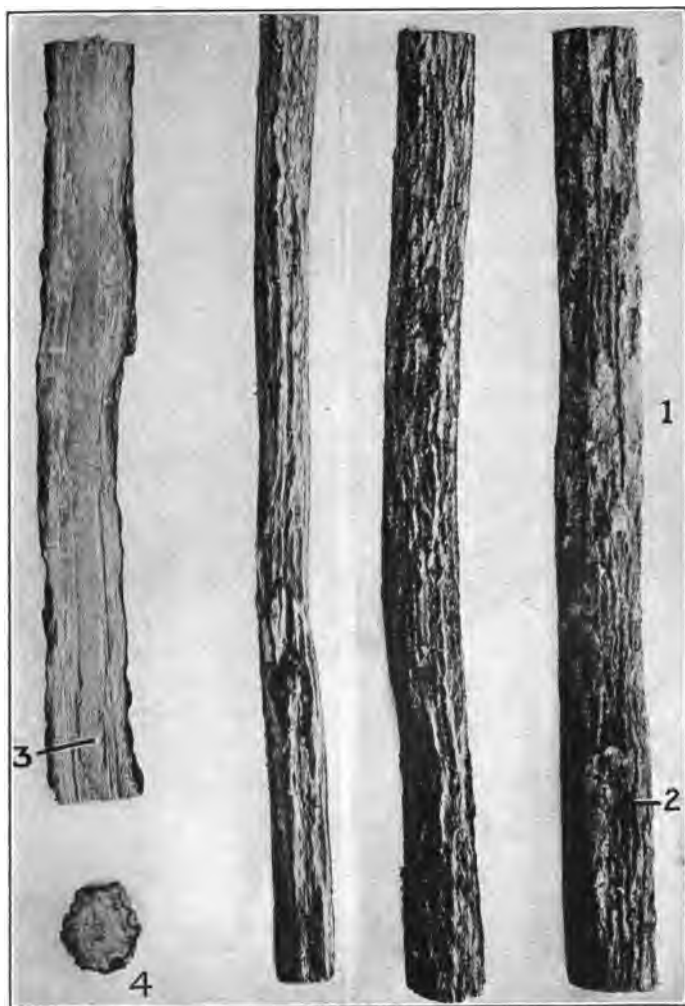
Extractum Glycyrrhizæ Purum.

Fluidextractum Glycyrrhizæ; Dose, 2 mls (30 min.).

Mistura Glycyrrhizæ Composita (from extract); Dose, 10 mls (2½ fl. drs.).

Pulvis Glycyrrhizæ Compositus; Dose, 4 Gm. (1 drachm.).

Syrupus Glycyrrhizæ N. F.; Dose, 8 mls (2 fl. drs.).



GLYCYRRHIZA—SPANISH

1, Rhizome showing wrinkled surface. 2, Small bud. 3, Longitudinal section showing central pith and cortex. 4, Cross-section of rhizome.

GLYCYRRHIZA (Glycyrrh.) U. S. P.

(2) Spanish Glycyrrhiza

English name: Glycyrrhiza.

Synonyms: Licorice, Liquorice Root, Spanish Licorice.

Botanical origin: *Glycyrrhiza glabra typica* Regel et Herder. (Fam. *Leguminosæ*.)

Part used: Rhizome and roots.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Central and Western Asia, Southern Europe.

Description:

Spanish Glycyrrhiza occurs as the entire rhizome and root, or as sawed sections arranged in bundles and held together with wire bands, or it occurs as small cut pieces called *cut licorice*, or as the cut stems, rhizomes, and roots separated in making the bundles and known as *licorice cuttings*. This contains much worthless stem bases. The entire drug measures up to 1 m. in length and to 2 cm. in diameter. The rhizome is simple and the crown usually has several stem bases, which vary in color from grayish brown to nearly black, very woody, and with brown piths. The texture is fibrous. The color is grayish or purplish brown with light yellow longitudinal patches of cork. The surface of the rhizome is rough, longitudinally wrinkled, and has alternately arranged buds. The roots are small, inconspicuous, and occur near the bud. The fracture is tough and uneven. The outline of the cross-section is nearly cylindrical. The cortex is thick and radiate. The cambium zone is distinct. The wood is yellowish green, radiate and porous. The pith is bright yellowish green. The odor is slightly aromatic. The taste is sweet.

Constituents: Glycyrrhizin, volatile oil, asparagin, resin, sugar, yellow coloring matter, bitter principle, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Elixir Glycyrrhizæ (from fluidextract).

Elixir Glycyrrhizæ Aquosum N. F.; Dose, 8 mils (2 fl. drs.).

Elixir Glycyrrhizæ Aromaticum N. F.; Dose, 8 mils (2 fl. drs.).

Fluidglyceratum Glycyrrhizæ N. F.; Dose, 2 mils (30 min.).

Extractum Glycyrrhizæ.

Extractum Glycyrrhizæ Purum.

Fluidextractum Glycyrrhizæ; Dose, 2 mils (30 min.).

Mistura Glycyrrhizæ Composita (from extract); Dose, 10 mils (2½ fl. drs.).

Pulvis Glycyrrhizæ Compositus; Dose, 4 Gm. (1 drachm).

Syrupus Glycyrrhizæ N. F.; Dose, 8 mils (2 fl. drs.).



ECHINACEA

1, Stem of plant. 2, Typical rhizome and root. 3, Longitudinal section. 4, Transverse section.

ECHINACEA (Echin.) N. F.

English name: Echinacea.

Synonyms: Pale Purple Cone Flower.

Botanical origin: *Brauneria pallida* (Nuttall) Britton
(*Echinacea angustifolia* De Candolle). (Fam.
Compositæ.)

Part used: Rhizome and roots.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Central and Southern United States.

Description:

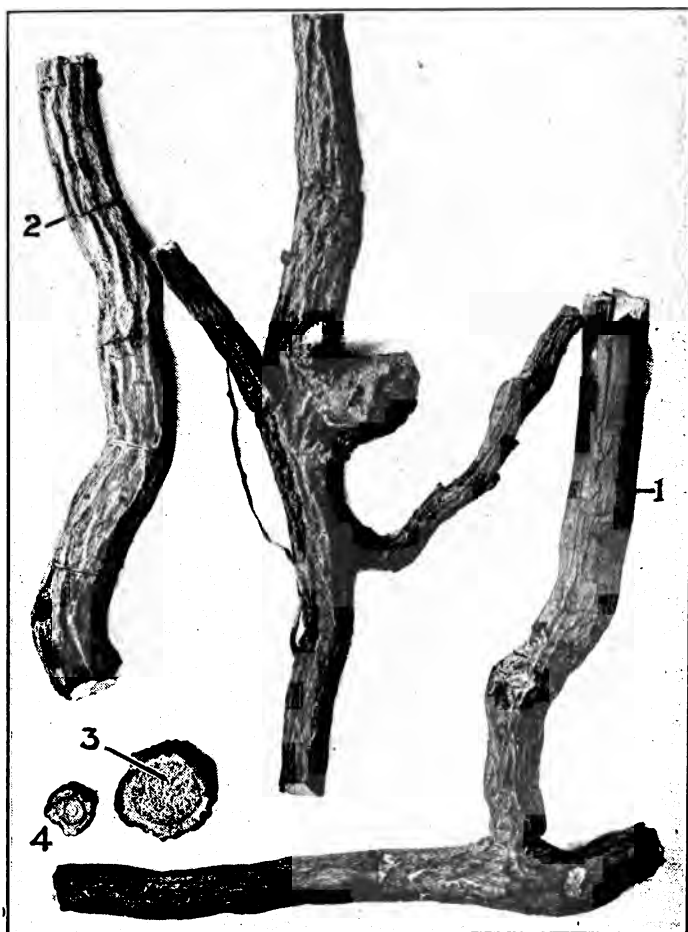
Echinacea occurs as a mixture of entire and broken pieces of the rhizome and roots. These pieces measure up to 25 cm. in length and to 3.8 cm. in diameter. *Echinacea* is a vertical rhizome and root, and is usually crooked and twisted. The crown is simple or multiple. The stem bases are gray or purplish brown, annulate near the crown, striated above, and have a white pith. The texture is fibrous. The color varies from gray and yellow to reddish brown. The surface of the crown is annulate; that of the root, longitudinally striated and wrinkled. The fracture is tough when dry, but it is slightly pliable when moist. The outline of the sections is cylindrical. The cortex is thick and grayish or brownish black. The wood has alternate yellow wedge-shaped masses of conducting tissue and parenchymatic tissue with black cell contents. The pith is small and circular. The odor is not characteristic. The taste is sweet and tingling.

Constituents: Acrid resin, possibly also an alkaloid, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum *Echinacæ*; Dose, 1 ml (15 min.).



APOCYNUM

1, Portion of stem. 2, Wrinkled and fissured root. 3, Transverse section showing the porous wood. 4, Small transverse section.

APOCYNUM (Apocyn.) N. F.

English name: Apocynum.

Synonyms: Canadian Hemp.

Botanical origin: *Apocynum cannabinum* Linné.
(Fam. *Apocynaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: United States and Canada.

Description:

Apocynum occurs as broken pieces of the rhizome with and without roots. The *rhizome* measures up to 5 cm. in length and to 2 cm. in diameter. The *roots* are small and may measure up to 5 cm. in length. The rhizome is horizontal and simple or branched. The *stem bases* are purplish brown. The *bark* is thin and frequently removed. The *wood* is yellow and the center is usually hollow. The *texture* is starchy. The *color* is gray or purplish brown. The *surface* of the rhizomes is longitudinally furrowed and transversely fissured. The *fracture* is weak and even. The *outline* is irregularly cylindrical. The *cortex*, which is thick, has dark latex cavities. The *cambium zone* is distinct. The *wood* is yellowish and coarsely porous. The *odor* is not distinct. The *taste* is sweet, bitter and acrid.

Constituents: Glucosides (apocynin and apocynin), resin, starch, gum, tannin, etc.

Dose: 0.75 Gm. (12 grains).

Preparations:

Fluidextractum Apocyni; Dose, 0.75 mil (12 min.).



GENTIANA

1, Root with numerous leaf bases. 2, Deep wrinkles. 3, Annulate rhizome portion. 4, Curved and twisted root. 5, Cross-section of root showing dark cambium zone.

GENTIANA (Gentian.) U. S. P.

English name: Gentian.

Synonyms: Yellow Gentian Root.

Botanical origin: *Gentiana lutea* Linné. (Fam. *Gentianaceæ*.)

Part used: Rhizome and root.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Central and Southern Europe.

Description:

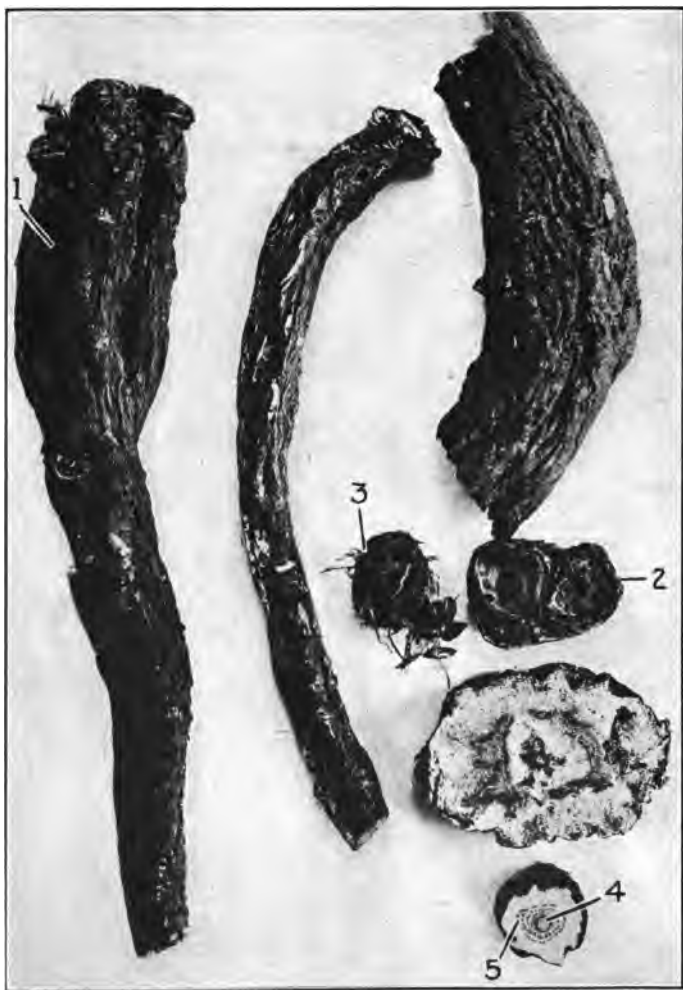
Gentian root occurs as broken pieces and rarely as entire roots. These roots measure up to 8.5 dm. in length, but are usually shorter, and to 37 mm. in diameter. The rhizome and root are vertical and simple or branched. The crown terminates in a circular stem scar or in leafy scales surrounding the undeveloped stem. The texture is non-starchy and slightly waxy. The color is light or dark yellowish brown. The surface of the rhizome is annulate and rough with fibers from leaf bases; that of the root, deeply wrinkled longitudinally. The fracture is brittle when the root is dry, but pliable when it is moist. The outline is very irregular on account of wrinkles. The cortex is of variable thickness and yellow-brown. The cambium zone is dark brown. The wood is distinctly radiate near the cambium, but less so near the large brownish yellow pith. The odor is aromatic. The taste is sweet or strongly bitter.

Constituents: Fat, resin, pectin, sugar, glucosides (gentiopierin, gentisin), yellow coloring matter, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Elixir Gentianæ N. F.; Dose, 4 mls (1 fl. dr.).
Elixir Gentianæ et Ferri N. F.; Dose, 4 mls (1 fl. dr.).
Elixir Gentianæ et Ferri Phosphatis N. F.; Dose, 4 mls (1 fl. dr.).
Elixir Gentianæ Glycerinatum N. F.; Dose, 8 mls (2 fl. drs.).
Extractum Gentianæ; Dose, 0.25 Gm. (4 grains).
Fluidextractum Gentianæ; Dose, 1 ml (15 min.).
Tinctura Amara N. F.; Dose, 2 mls (80 min.).
Tinctura Gentianæ Composita; Dose, 4 mls (1 fl. dr.).



TARAXACUM

1, Multiple crown and root below. 2, Surface view of crown with depressed scars. 3, Scales occurring in the crown. 4, Yellow porous wood. 5, Cortex with concentric zones of latex.

TARAXACUM (Tarax.) U. S. P.

English name: Taraxacum.

Synonyms: Dandelion, Foreign Dandelion, Lion's Tooth.

Botanical origin: *Taraxacum officinale* Weber. (Fam. Compositæ.)

Part used: Rhizome and root.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Europe; naturalized in the United States, where it is a common weed.

Description:

Dandelion occurs as a mixture of entire and broken fragments of the rhizome and roots. These fragments measure up to 16 cm. in length and to 3 cm. in diameter at the crown. Dandelion is a vertical rhizome and root, and it may be simple or branched. Leaf bases or leaf scars terminate the branches of the crown. The texture is waxy. The color varies from light gray to dark reddish brown. The surface of the crown is annulate with leaf scales; that of the roots is irregularly and longitudinally wrinkled. The crown is hollow or has a mass of brown hairs from scales and undeveloped leaves. The fracture is brittle when dry but pliable when moist. The outline is cylindrical. The cortex makes up the greater part of the root and has dark, concentric circles of laticiferous ducts. The cambium zone is dark brown and distinct. The wood is yellow, and in the older roots and rhizome a pith is present. The odor is not distinct. The taste is sweet and bitter.

Constituents: Resin, bitter principles, inulin, levulin, pectin, etc.

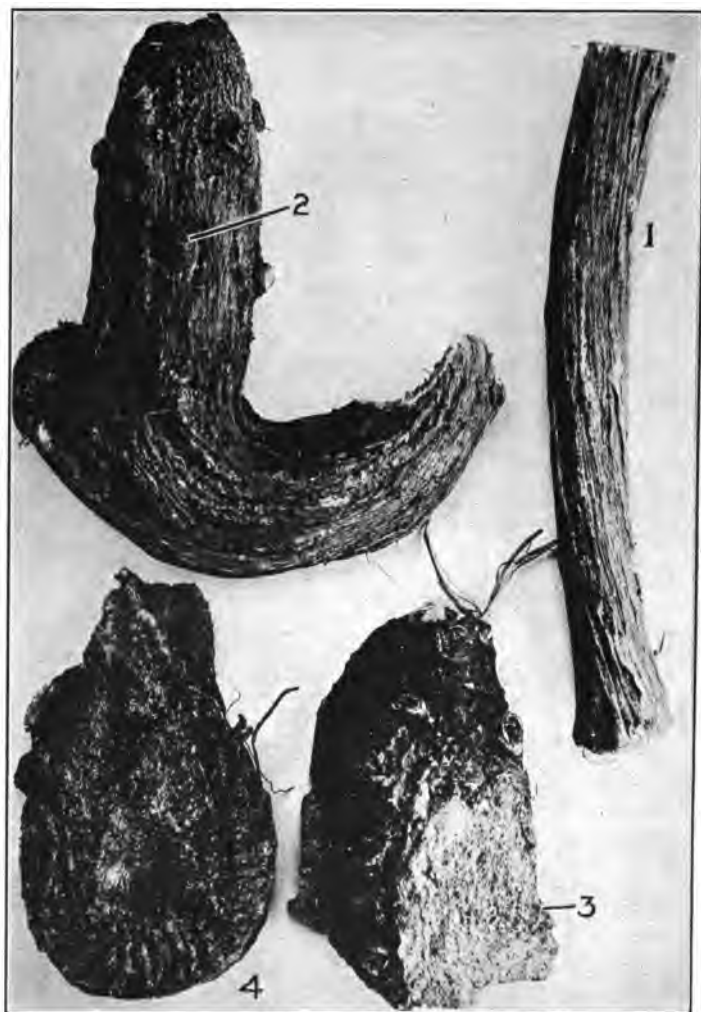
Dose: 10 Gm. (2½ drachms).

Preparations:

Elixir Taraxaci Compositum N. F.; Dose, 8 mls (2 fl. drs.).

Extractum Taraxaci; Dose, 1 Gm. (15 grains).

Fluidextractum Taraxaci; Dose, 10 mls (2½ fl. drs.).



INULA

1, Longitudinally furrowed surface. 2, Stem scar. 3, Cut surface of the rhizome. 4, Resinous cut surface.

INULA N. F.

English name: Inula.

Synonyms: Elecampane, Horsehead.

Botanical origin: *Inula Helenium* Linné. (Fam. *Compositæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of its stem bases or other foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Asia, Central Europe; naturalized in Northeastern North America, south to North Carolina, west to Missouri.

Description:

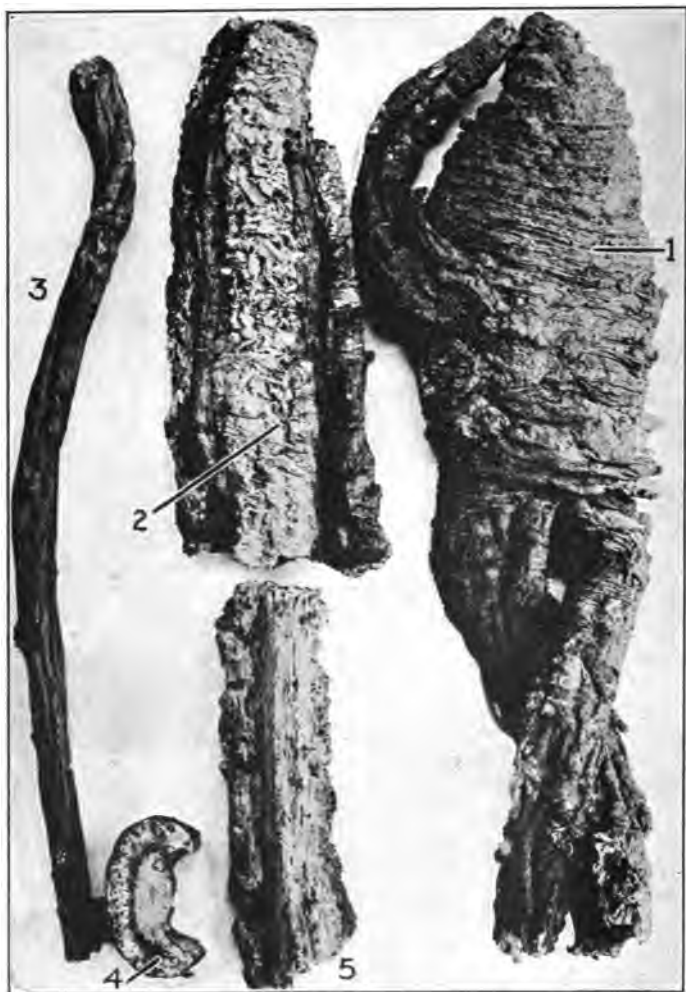
Inula occurs as a mixture of entire rhizomes and roots, as broken and as cut slices. The rhizomes measure up to 6.5 cm. in diameter near the crown. The roots measure up to 18 cm. in length. The roots are simple or branched. The crown has one or more stem scars, or short stem bases, or the fibrous remains of stems, or a central terminal bud with grayish brown scales. The texture is resinous and fibrous. The color varies from a light yellow to brownish black. The surface of the crown is slightly annulate and longitudinally furrowed, and has several prominent buds. The surface of the roots is longitudinally furrowed and wrinkled, and has root scars. The fracture is very strong, tough and even when dry, long and pliable when moist. The outline of the cross-section is nearly cylindrical. The cortex is of unequal diameter, brownish white, and finely radiate. The cambium zone is distinct. The wood is finely radiate and has yellowish green resin masses. The pith is small and inconspicuous. The odor is aromatic. The taste is sweet, pungent, or acrid.

Constituents: Volatile oil, resin, mucilage, helenin, inulin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Enters into *Pilule Antiperiodicæ* N. F., and *Tinctura Antiperiodica* N. F.



ANGELICÆ RADIX—AMERICAN

1, Annulate rhizome with several branches. 2, Large white pith. 3, Small root. 4, Cross-section showing cortex with resin cells and slightly radiate wood, and pith. 5, Longitudinal section.

ANGELICÆ RADIX (Angel. Rad.) N. F.

(1) American Angelica Root

English name: Angelica Root.

Synonyms: American Angelica, Great Angelica, Purple Angelica.

Botanical origin: *Angelica atropurpurea* Linné and other species of *Angelica*. (Fam. *Umbelliferae*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of stem bases and leaves or other foreign matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Eastern United States, south to Delaware, west to Minnesota.

Description:

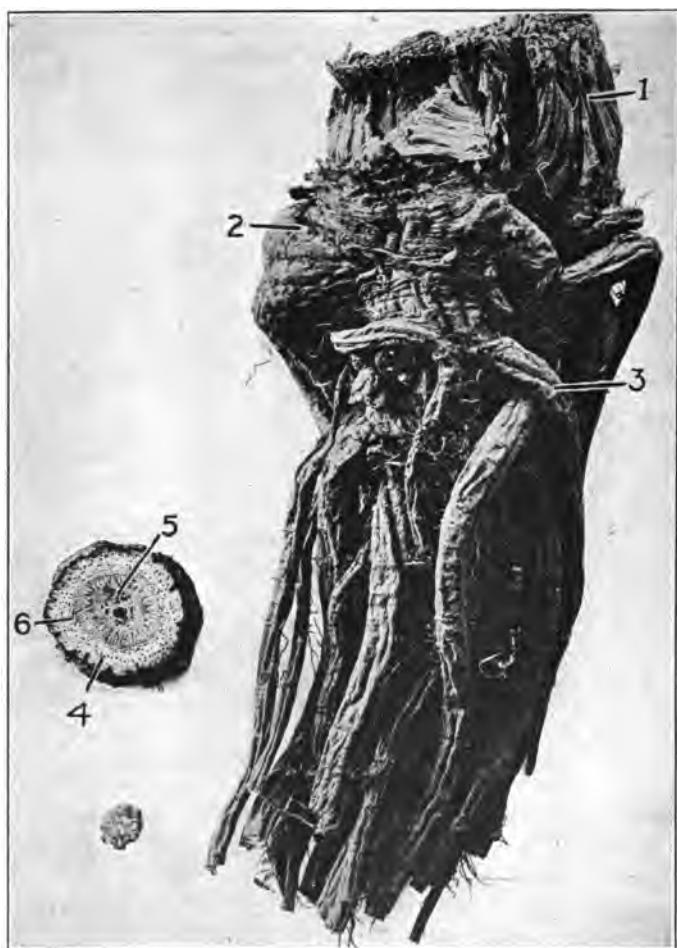
American Angelica Root occurs as a mixture of the longitudinally cut rhizome with entire and cut roots. The rhizome and roots measure up to 30 cm. in length, the crown to 4 cm. in diameter, and the roots to 15 mm. in diameter. The rhizome is usually simple, but the roots are branched. The crown tapers upward and is usually free of scales and stem bases. The texture is non-fibrous. The color varies from grayish yellow to grayish brown. The surface of the rhizome is prominently annulate; that of the roots is longitudinally wrinkled, and has elevated points of origin of rootlets or root scars. The fracture is very weak, brittle, even when dry, but soft and pliable when moist. The outline of cross-section is nearly cylindrical. The cortex is thick, radiate, and has scattered yellowish oleoresin cavities. The cambium zone is distinct. The wood is radiate and the pith is large and frequently separated in the rhizome into layers by longitudinal clefts. The odor is aromatic. The taste is sweet, pungent and tingling.

Constituents: Volatile oil, acid resin (angelicin), angelic acid, starch, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Angelicæ Radicis; Dose, 2 mls (30 min.).



ANGELICÆ RADIX—EUROPEAN

1, Numerous leaf bases attached to the crown. 2, Annulate surface. 3, Small pliable root. 4, Cortex with resin cavities. 5, Pith. 6, Radiate yellow wood.

ANGELICÆ RADIX (Angel. Rad.) N. F.

(2) European Angelica Root

English name: Angelica Root.

Synonyms: European Angelica, Garden Angelica, Arkangel.

Botanical origin: *Angelica Archangelica* Linné and other species of *Angelica*. (Fam. *Umbelliferæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of stem bases and leaves or other foreign matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Northern Europe; cultivated in France, Germany and Belgium.

Description:

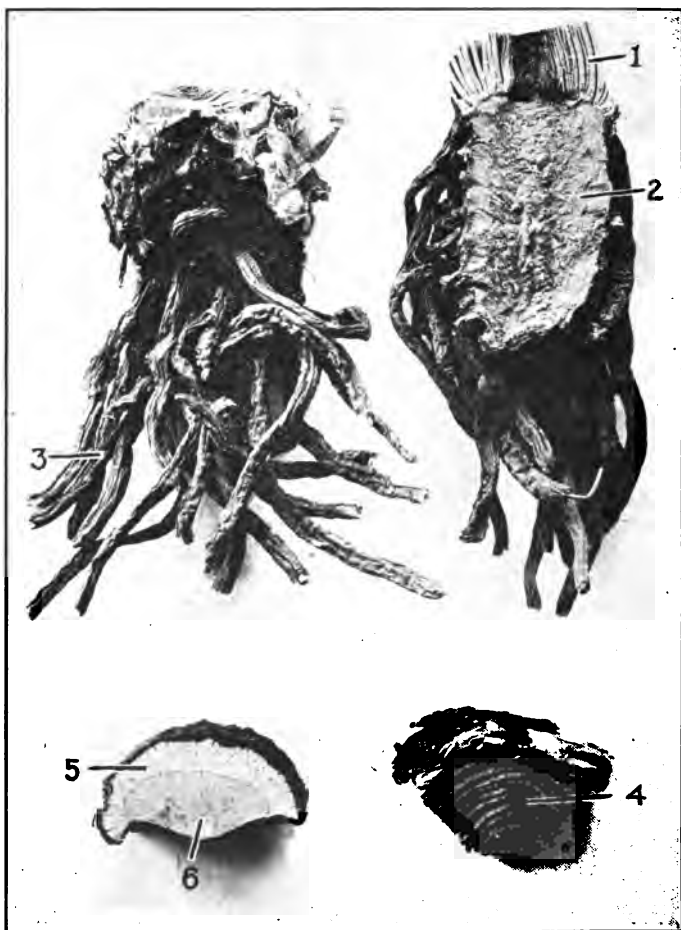
German Angelica Root occurs as the entire rhizome with its numerous roots folded, twisted and braided. The drug measures up to 15 cm. in length and to 4.5 cm. in diameter at the crown. The rhizome and the roots are simple or branched. The crown has numerous concentric purplish or brown prominently veined scales. The texture is fleshy. The color varies from a light grayish brown to a purplish brown. The surface of the rhizome portion is annulate. The surface of the roots is longitudinally furrowed and with small transversely elongated ridges which are the point of origin of the rootlets. The fracture is short when dry, but long and pliable when moist. The outline of cross-sections of the rhizome and roots is nearly cylindrical. The cortex is thick, radiate, and with numerous isolated, yellowish brown oleoresin cavities. The cambium zone is distinct. The wood is distinctly radiate. The pith is large and frequently longitudinally cleft in the rhizome. The odor is aromatic. The taste is aromatic and pungent.

Constituents: Volatile oil, acrid resin (angelicin), angelic acid, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Angelicæ Radicis; Dose, 2 mls (30 min.).



VERATRUM VIRIDE

1, Concentric leaf bases attached to the crown. 2, Longitudinal section of the rhizome. 3, Curved and twisted soft-tissued roots. 4, Surface view of the crown. 5, Cross-section of the rhizome showing the cortex. 6, Central cylinder.

VERATRUM VIRIDE (Verat. Vir.) U. S. P.

English name: Veratrum Viride.

Synonyms: Green Hellebore, American White Hellebore.

Botanical origin: *Veratrum viride* Aiton. (Fam. *Liliaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of stems and other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Eastern North America, south to Georgia and Tennessee.

Description:

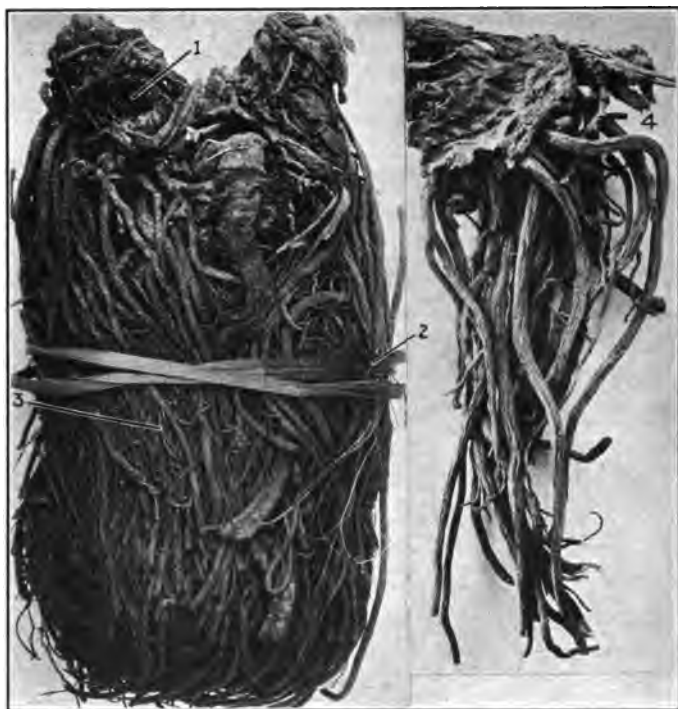
Veratrum Viride occurs as a mixture of the entire rhizome and the roots with longitudinal sections of the rhizomes. The *rhizome* is vertical, short or elongated; both roots and rhizomes are simple. The rhizomes have a maximum length of 10 cm. and width of 4 cm. The upper part of the rhizome has numerous concentric leaf scales. The *texture* is starchy and resinous. The *color* of the scales is yellowish white, of the roots gray or grayish yellow, of the rhizome brownish black. The *surface* of the scales is striated, that of the rhizome rough, that of the roots wrinkled. The *fracture* of the rhizome is strong and tough, that of the roots very weak and brittle. The *outline* of entire rhizomes and of roots is cylindrical. The *cortex* is thick, and it has scattered masses of yellowish conducting cells. The *endodermis* is very distinct and yellowish brown. The *central cylinder* has numerous irregular groups of yellowish conducting tissue. The *odor* is not distinct. The *taste* is sweet, bitter or acrid.

Constituents: Alkaloids (veratrine, rubiervine), fat, resin, gum, starch, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

Fluidextractum Veratri Viridis; Dose, 0.1 ml (1½ min.).
Tinctura Veratri Viridis; Dose, 0.5 ml (8 min.).



VALERIANA

1, Stem scar of valerian and folded roots. 2, Double band of grass. 3, Mass of roots. 4, Split rhizome and the large roots of Belgian valerian.

VALERIANA (Valer.) U. S. P.

English name: Valerian.

Synonyms: Valerian Root, Garden Valerian.

Botanical origin: *Valeriana officinalis* Linné. (Fam. Valerianaceæ.)

Part used: Rhizome and root.

Impurities: None given.

Assay: None given.

Ash: Not more than 20 per cent.

Habitat: Europe and Asia; cultivated in Germany, Belgium and England; naturalized in New York and New Jersey.

Description:

Valeriana occurs as a mixture of the entire rhizome and roots and of cut sections of the rhizome with roots. The rhizomes of German *Valeriana* are usually entire. The roots are folded and held together with a blade of dried grass passed twice around the roots and tied. The rhizomes measure up to 4 cm. in length, and to 2 cm. in diameter. The roots measure up to 18 cm. in length, and to 3 mm. in diameter. The rhizome is vertical, simple or branched, and has one or more stem bases and numerous leaf scales. The roots are branched or simple. The texture is non-fibrous and waxy. The color varies from a gray to yellowish brown. The surface of the rhizome is rough from root scars and is annulate. The roots are wrinkled longitudinally. The fracture of the roots is very weak and brittle. The outline of entire rhizomes and roots is cylindrical. The cortex is thick. The cambium zone is distinct. The wood has a yellow ring of conducting tissue. The pith is white or grayish white. The cortex of the root is thick and yellowish brown. The wood is small, central and cylindrical. The odor is strongly and persistently aromatic. The taste is sweet and pungent.

Constituents: Volatile oil, acids, tannin, sugar, mucilage, resin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Valerianæ N. F.; Dose, 2 mls (30 min.).

Tinctura Valerianæ; Dose, 4 mls (1 fl. dr.).

Tinctura Valerianæ Ammoniata; Dose, 2 mls (30 min.).



CAULOPHYLLUM

1, Circular depressed stem scar of the rhizome. 2, Wiry branched roots.

CAULOPHYLLUM (Cauloph.) N. F.

English name: Caulophyllum.

Synonyms: Blue Cohosh, Papoose Root, Squaw Root.

Botanical origin: *Caulophyllum thalictroides* (Linné)
Michaux. (Fam. *Berberidaceæ*.)

Part used: Rhizome and roots.

Impurities: None given.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Eastern North America south to North Carolina, west to Nebraska.

Description:

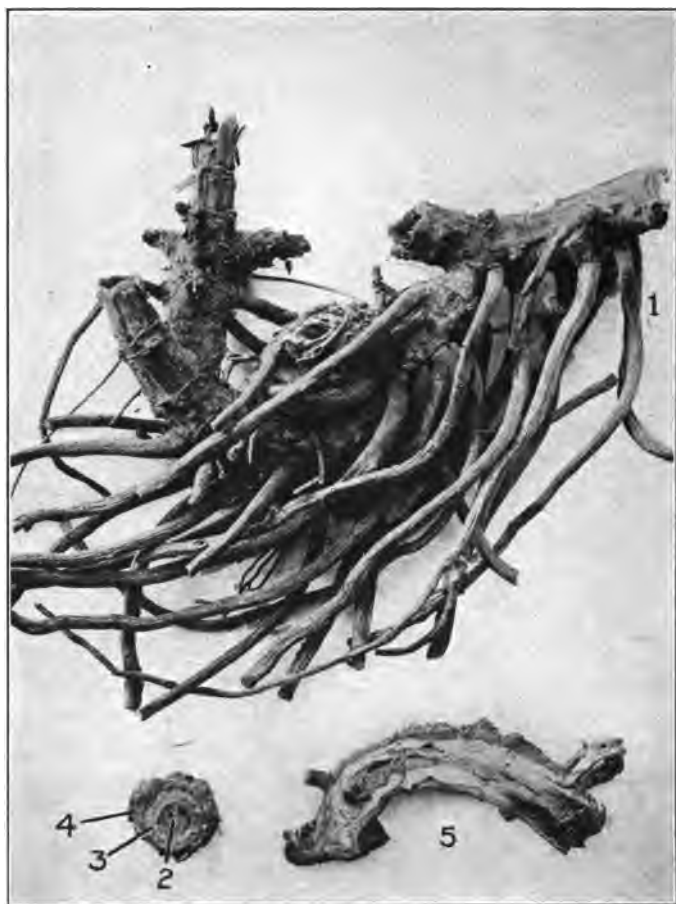
Caulophyllum occurs as a mixture of entire and broken pieces of the rhizomes and roots. The *rhizomes* measure up to 20 cm. in length and up to 18 mm. in diameter. The branched *roots* measure up to 15 cm. in length and to 3 mm. in diameter. The rhizomes are horizontal and irregularly branched, and they are marked above with circular, depressed, contiguous stem scars. The *texture* is fibrous. The *color* is grayish brown. The *surface* of the rhizome is annulate between the stem scars. The *roots* are finely striated longitudinally. The *fracture* is tough and hackly. The *outline* of cross-sections is nearly cylindrical. The *cortex* of the rhizome is thin. The *wood* is fibrous and radiate. The *pith* is large, solid, or cleft, and brownish. The *odor* is not characteristic. The *taste* is strongly bitter and acrid.

Constituents: Gum, starch, resins, alkaloid (caulophylline), glucoside (leontin), etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Fluidextractum Caulophylli; Dose, 0.5 mil (8 min.).



LEPTANDRA

1, Rhizome, stem bases and numerous woody tough roots.
 2, Purplish pith. 3, Wood. 4, Cortex. 5, Longitudinal
 section of the rhizome.

LEPTANDRA (Leptand.) N. F.

English name: Leptandra.

Synonyms: Culver's Root, Culver's Physic.

Botanical origin: *Veronica virginica* Linné. (Fam. *Scrophulariaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Eastern Canada, and United States south to Alabama and west to Nebraska.

Description:

Leptandra occurs as a mixture of entire and broken pieces of the rhizome and roots. The rhizomes measure up to 27 cm. in length and to 14 cm. in diameter. The roots measure up to 15 cm. in length and to 3 mm. in diameter. The rhizome is horizontal, simple, or branched, and has a large woody, hollow stem base, frequently 3 cm. in length, and undeveloped buds. The older portions of the rhizome have the shortest stem bases. The texture is fibrous. The color varies from grayish to purplish brown. The surface of the rhizome is annulate with slightly elevated leaf scars. The surface of the roots is wrinkled longitudinally. The fracture is tough and uneven. The outline of cross-sections is nearly cylindrical. The cortex of the rhizome is thin, resinous and dark brown. The wood of the rhizome is yellowish brown and forms a compact ring. The pith of the rhizome is purplish brown. The roots have a purplish brown cortex and a small gray central cylinder. The odor is not characteristic. The taste is bitter and acrid.

Constituents: Bitter principle (leptandrin), resin, saponin, tannin, gum, mannit, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Extractum Leptandræ; Dose, 0.25 Gm. (4 grains).

Fluidextractum Leptandræ; Dose, 1 mil (15 min.).



CIMICIFUGA

1, Portion of the stem. 2, Annulate stem bases. 3, Small root. 4, Cross-section of a stem base showing interrupted wood bundles.

CIMICIFUGA (Cimicif.) U. S. P.

English name: Cimicifuga.

Synonyms: Black Cohosh, Black Snakeroot, Macrotys.

Botanical origin: *Cimicifuga racemosa* (Linné) Nuttall. (Fam. *Ranunculaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 2 per cent. of stems or foreign matter.

Assay: None given officially.

Ash: Not more than 10 per cent.

Habitat: Eastern North America south to Georgia, west to Missouri.

Description:

Cimicifuga occurs as a mixture of entire, cut and broken pieces of the rhizome and roots. The rhizomes measure up to 15 cm. in length and to 30 mm. in diameter, the broken roots up to 10 cm. in length and to 3 mm. in diameter. The rhizome is horizontal, and has several large stem bases, which frequently measure 10 cm. in length, and several undeveloped buds. The texture is resinous and fibrous. The color varies from grayish brown to brownish black. The surface of the rhizome is annulate with elevated leaf scales; and the ends of the stem bases are frequently separated into fibrous strands. The fracture is very strong, tough and uneven. The outline of cross-sections is nearly cylindrical. The cortex is thin. The wood has a broad interrupted radiating structure. The pith is large and solid. The roots are cylindrical or obtusely angled. The cortex is thick and nearly black. The wood is radiate with two to six widely separated strands. The odor is not characteristic. The taste is bitter and acrid.

Constituents: Resin, cimicifugin, volatile oil, sugar, gum, starch, tannin, etc.

Dose: 1 Gm. (15 grains).

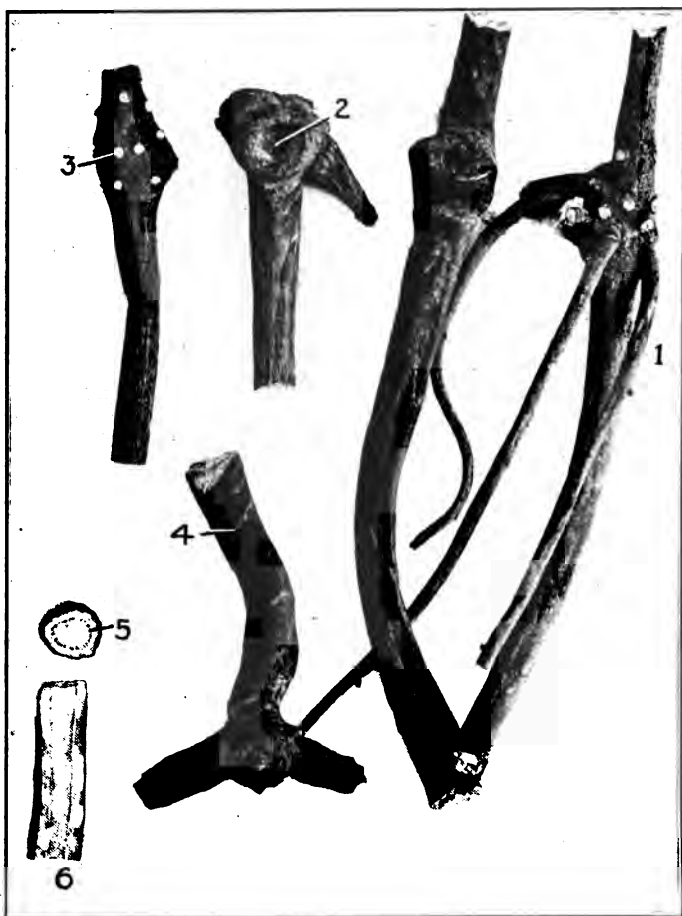
Preparations:

Extractum Cimicifugæ. Dose, 0.25 Gm. (4 grains).

Fluidextractum Cimicifugæ; Dose, 1 mil (15 min.).

Syrupus Cimicifugæ Compositus N. F.; Dose, 4 mls (1 fl. dr.).

Tinctura Cimicifugæ N. F.; Dose, 4 mls (1 fl. dr.).



PODOPHYLLUM

1, Under surface of the rhizome showing stem scars and roots. 2, Depressed stem scar. 3, Root scar. 4, Annulate leaf scar. 5, Cross-section showing interrupted conducting strands. 6, Longitudinal section of the rhizome.

PODOPHYLLUM (Podoph.) U. S. P.

English name: Podophyllum.

Synonyms: Mandrake, May Apple Rhizome.

Botanical origin: *Podophyllum peltatum* Linné.
(Fam. *Berberidaceæ*.)

Part used: Rhizome and roots.

Impurities: None given officially.

Assay: Not less than 3 per cent. of resin.

Ash: Not more than 3 per cent.

Habitat: Eastern and Central North America.

Description:

Podophyllum occurs as a mixture of entire and broken pieces of the rhizome and root. It measures up to 30 cm. in length and to 15 mm. in diameter at the node. It is a horizontal rhizome with enlarged nodes, each with a circular depressed stem scar and an occasional undeveloped bud and long internodes up to 17 cm. in length. The texture is starchy or resinous. The color varies from gray and yellow to reddish brown. The upper surface of the rhizome is striated longitudinally, annulate with light-colored, slightly elevated leaf-scale scars and with deep, circular, depressed stem scars. The under surface of the rhizome at the node has several white root scars or several attached roots. The roots are finely striated longitudinally and of a grayish or yellowish brown color. The fracture of the rhizome and root is weak, brittle and even. The outline of the cross-section of the rhizome is circular or oval, that of the root circular. The cortex of the rhizome is thin and grayish white. The wood has an interrupted circle of isolated yellow conducting strands and a large grayish white pith. Longitudinal sections of the rhizome show the conducting strands as parallel lines. The root has a white cortex and a solitary central yellow conducting strand. The odor is not distinct. The taste is sweet, bitter or acrid.

Constituents: Resin, glucosides, starch, gum, fixed oil, acid, etc.

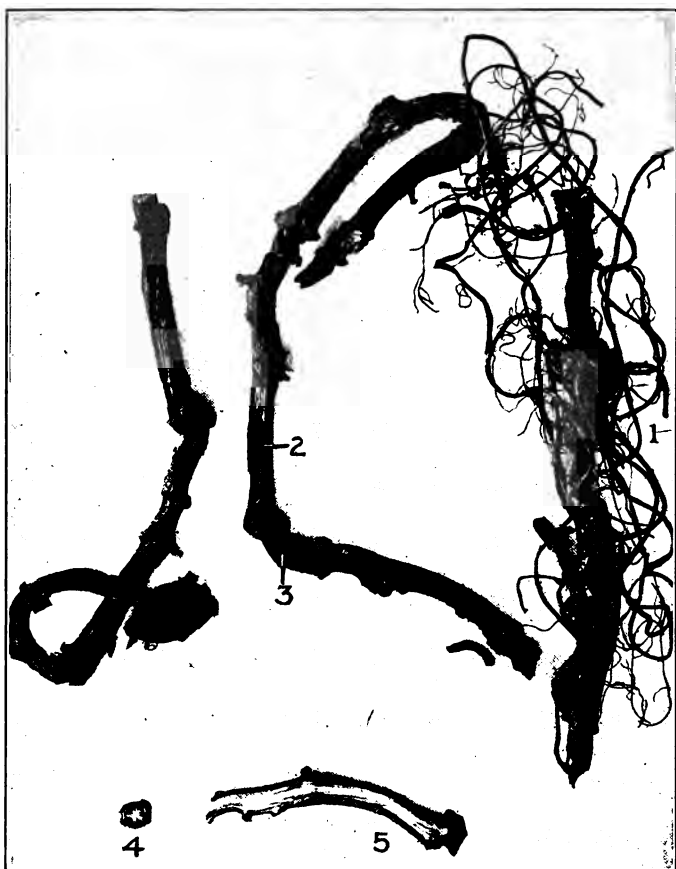
Dose: Used only in the form of its preparations.

Preparations:

Extractum Podophylli N. F.; Dose, 0.015 Gm. ($\frac{1}{4}$ grain).

Fluidextractum Podophylli; Dose, 0.5 ml (8 min.).

Resina Podophylli; Dose, 0.01 Gm. ($\frac{1}{4}$ grain).



ASARUM

1, Rhizome with numerous roots and rootlets. 2, Winged edge of the rhizome. 3, Enlarged node. 4, Cross-section showing branching wood. 5, Longitudinal section.

ASARUM (Asar.) N. F.

English name: Asarum.

Synonyms: Wild Ginger, Canada Snakeroot.

Botanical origin: *Asarum canadense* Linné. (Fam. *Aristolochiaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of other foreign matter.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Eastern North America south to North Carolina.

Description:

Asarum occurs as a mixture of the entire and broken pieces of the rhizome and roots. The rhizomes measure up to 20 cm. in length and to 6 mm. in diameter. The roots measure up to 10 cm. in length. The rhizome has enlarged nodes, is horizontal, simple or branched, and twisted or bent. The roots are branched. Petiole scars occur at the enlarged nodes. The texture is starchy or resinous. The color varies from light yellow to dark purplish brown. The surface is longitudinally striated and winged and occasionally annulate from leaf-scale scars. The fracture is very weak, brittle and even. The outline of the cross-section of the rhizome varies from nearly cylindrical to triangular or to quadrangular. The cortex is thin and dark yellowish brown. The wood has isolated, brown, conducting strands arranged in a circle. The pith is yellowish-white. The odor is aromatic. The taste is pungent.

Constituents: Volatile and fixed oil, starch, gum, resin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Syrupus Asari Compositus; Dose, 4 mls (1 fl. dr.).



CONVALLARIÆ RADIX

1, Rhizome with mass of curved, twisted roots. 2, Leafy scales of bud. 3, Node with radiate roots. 4, Internode with red spots.

CONVALLARIÆ RADIX (Convallar. Rád.) N. F.

English name: Convallaria Root.

Synonyms: Lily-of-the-Valley Root.

Botanical origin: *Convallaria majalis* Linné. (Fam. *Liliaceæ*.)

Part used: Rhizome and roots.

Impurities: None given.

Assay: None given officially.

Ash: Not more than 10 per cent.

Habitat: North America, Europe and Northern Asia; cultivated for its flower.

Description:

Convallaria Root occurs as a mixture of entire and broken pieces of the rhizome and root. The rhizome measures up to 25 cm. in length and to 4 cm. in diameter; the internodes measure up to 4.5 cm. in length. The roots measure up to 15 cm. in length. The rhizome is horizontal, simple, or branched, and has enlarged nodes, a circle of roots, or root scars, and an occasional undeveloped branch or stem. Stem bases with leafy scales frequently terminate the rhizome. The texture is fibrous. The color varies from light yellow to dark brown, with purple patches. The surface of the rhizome is longitudinally striated. The nodes are enlarged and have prominent root scars or roots. The fracture is weak, tough, even and incomplete. The outline of the rhizome and roots is nearly cylindrical. The cortex is thin. The endodermis is distinct when magnified. The central cylinder has isolated conducting strands. The pith is frequently hollow. The odor is not distinct. The taste is sweet, bitter and acrid.

Constituents: Volatile oil, resin, glucosides (convallamarin, convallarin), etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Fluidextractum Convallarise Radicis; Dose, 0.5 mil (8 min.).



TRITICUM

1, Node with circle of roots. 2, Mass of chopped rhizomes.
3, Cross-section of the rhizome with hollow pith. 4, Furrowed internode.

TRITICUM (Tritic.) U. S. P.

English name: Triticum.

Synonyms: Couch Grass, Dog Grass.

Botanical origin: *Agropyron repens* (Linné) Beauvois. (Fam. Gramineæ.)

Part used: Rhizome and roots.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 3 per cent.

Habitat: Europe, Asia; naturalized and common in North America.

Description:

Triticum occurs as a mixture of entire and broken pieces, or as cut pieces of the rhizome and roots. It measures up to 40 cm. in length and to 3 mm. in diameter. The branched roots measure up to 7 cm. in length. The rhizome is horizontal, slightly enlarged at the nodes, and has a circle of roots or root scars and an occasional undeveloped branch. The internodes measure up to 3.5 cm. The texture is fibrous. The color varies from yellow to yellowish brown. The surface of the internodes of the rhizome is longitudinally furrowed and smooth, the fracture is very tough, even and incomplete. The outline of cross-sections of the rhizome is irregular and circular and the central portion is hollow. The odor is not distinct. The taste is sweet.

Constituents: Bitter principle (triticin), levulose, acid malates, gum, etc.

Dose: 8 Gm. (2 drachms).

Preparations:

Fluidextractum Tritici; Dose, 10 mils (2½ fl. drs.).



CYPRIPEDIUM

- 1, Rhizome with numerous crooked roots. 2, Typical root.
3, Stem scar.

CYPRIPEDIUM (Cypriped.) N. F.

English name: Cypripedium.

Synonyms: Lady Slipper Root, Yellow Lady's Slipper Root.

Botanical origin: *Cypripedium hirsutum* Miller, *Cypripedium pubescens* Willdenow, or *Cypripedium parviflorum* Salisbury. (Fam. *Orchidaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of parts of the same plant or other foreign matter.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Canada and United States, south to Georgia and west to Nebraska.

Description:

Cypripedium occurs as a mixture of entire and broken pieces of the rhizome and roots. The rhizomes measure up to 11 cm. in length and to 7 mm. in diameter. The rhizome is horizontal and usually simple. The upper surface has several circular depressed stem scars which are not over 5 mm. apart. Attached to all sides of the rhizome are numerous curved and twisted roots. The texture is non-fibrous. The color of the rhizome varies from yellowish to brownish black; the roots are yellowish brown. The surface of the rhizome and roots is finely striated. The fracture of the rhizomes and roots is very weak, brittle and uneven. The outline of cross-sections of rhizomes and roots is cylindrical. The cortex of the rhizome is thin, that of the root thick. The wood of the rhizome and root is distinctly not separated into wood and pith. The odor is aromatic. The taste is bitter and acrid.

Constituents: Volatile oil, acids, resin, tannin, starch, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Cypripedii; Dose, 1 mil (15 min.).



SANGUINARIA

- 1, Branched rhizome. 2, Rhizome with its small roots.
- 3, Stem scar. 4, Cross-section showing circular latex tubes.
- 5, Orange-black surface.

SANGUINARIA (Sanguin.) U. S. P.

English name: Sanguinaria.

Synonyms: Blood Root, Red Puccoon.

Botanical origin: *Sanguinaria canadensis* Linné.
(Fam. *Papaveraceæ*.)

Part used: Rhizome and roots.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Eastern Canada, south to Florida, west to Nebraska.

Description:

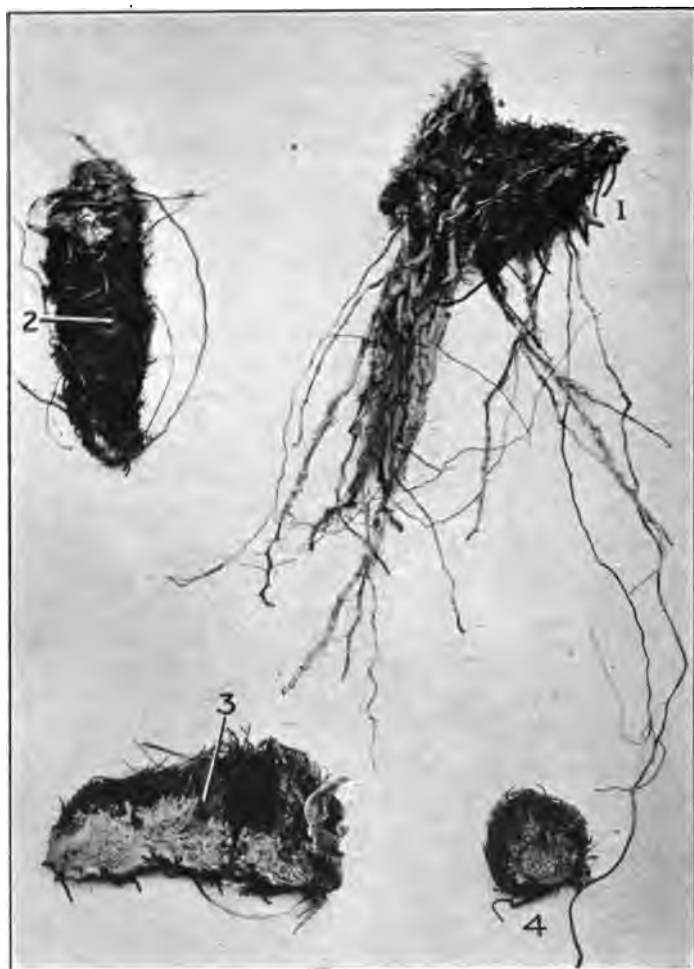
Sanguinaria occurs as a mixture of the entire and of the broken pieces of the rhizome and the roots. The rhizomes measure up to 10.5 cm. in length, to 16 mm. in width and to 12 mm. in height. The roots measure up to 1 mm. in width and to 7 cm. in length. The rhizomes are vertically compressed and horizontal; both the rhizomes and roots are simple or branched. The stem scars are depressed and frequently inconspicuous. The younger portion of the rhizome may have one or more yellowish brown leaf scales. The texture is starchy or resinous. The color varies from a grayish to a dark reddish brown. The upper surface has several stem scars and numerous incompletely annulate leaf scars and roots which are more numerous on the under surface. The fracture of the rhizome is tough and uneven. The outline of the rhizome is oval or, less frequently, cylindrical. The cortex is thin and has numerous reddish brown or black circular resin cavities. The wood varies in color from yellowish to brownish to reddish orange. It has numerous resin cavities which may show clearly or be indistinct. The odor is not characteristic. The taste is bitter and acrid.

Constituents: Alkaloids (sanguinarine, chelerythrine, protopine), citric and malic acids, resin, starch, etc.

Dose: 0.125 Gm. (2 grains).

Preparations:

Fluidextractum Sanguinaris N. F.; Dose, 0.1 mil (1½ min.).
Syrupus Sanguinaris N. F.; Dose, 2 mls (30 min.).
Tinctura Sanguinaris; Dose, 1 mil (15 min.).



ALETRIS

1, Rhizome and many roots with and without their cortex. 2, Stem scar. 3, Stem base. 4, Cross-section of the rhizome.

ALETRIS (Aletr.) N. F.

English name: Aletris.

Synonyms: True Unicorn Root, Star Grass.

Botanical origin: *Aletris farinosa* Linné. (Fam. *Liliaceæ*.)

Part used: Rhizome and roots.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 16 per cent.

Habitat: Maine to Ontario, south to Florida and Louisiana.

Description:

Aletris occurs as a mixture of the entire and the broken pieces of the rhizome and the roots. The rhizomes measure up to 5.5 cm. in length, and to 12 mm. in width and to 2 cm. in height. The roots measure up to 12 cm. in length and to 1 mm. in diameter. The rhizome is horizontal, simple or non-branched. The roots are tough and wiry, and simple or branched. The *stem scars* are circular, fibrous and hollow. The *stem bases* are often 8 mm. in length. The *texture* of the rhizome is starchy and fibrous, that of the root fibrous. The *color* of the rhizome varies from grayish yellow to grayish brown; that of the roots, gray when the cortex is present, or reddish brown when the cortex is removed. The *upper surface* of the rhizome has numerous fibrous remains of leaf bases and stem scars or stems. Numerous roots are attached to the side and under surface of the rhizome. The *fracture* of the rhizome is strong and tough; the roots have no fracture. The roots have no fracture because they are very strong, fibrous and flexible. The *outline* of the rhizome is irregular, that of the roots cylindrical. The *cortex* is thin and yellowish. The *endodermis* is distinct when magnified. The central cylinder is large, and it has numerous scattered yellowish cylindrical masses of conducting cells. The *odor* is not characteristic. The *taste* is starchy and bitter.

Constituents: Starch, bitter principle, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Aletridis; Dose, 2 mls (30 min.).



HYDRASTIS

1, A large rhizome with numerous roots. 2, Portion of a stem. 3, Stem scar. 4, Simple rhizome.

HYDRASTIS (Hydr.) U. S. P.

English name: Hydrastis.

Synonyms: Golden Seal, Orange Root.

Botanical origin: *Hydrastis canadensis* Linné. (Fam. *Ranunculaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 2 per cent. of stems, leaves or other foreign matter.

Assay: Not less than 2.5 per cent. of ether-soluble alkaloids.

Ash: None stated officially.

Habitat: Connecticut to Vermont, to Minnesota, south to Georgia and Missouri.

Description:

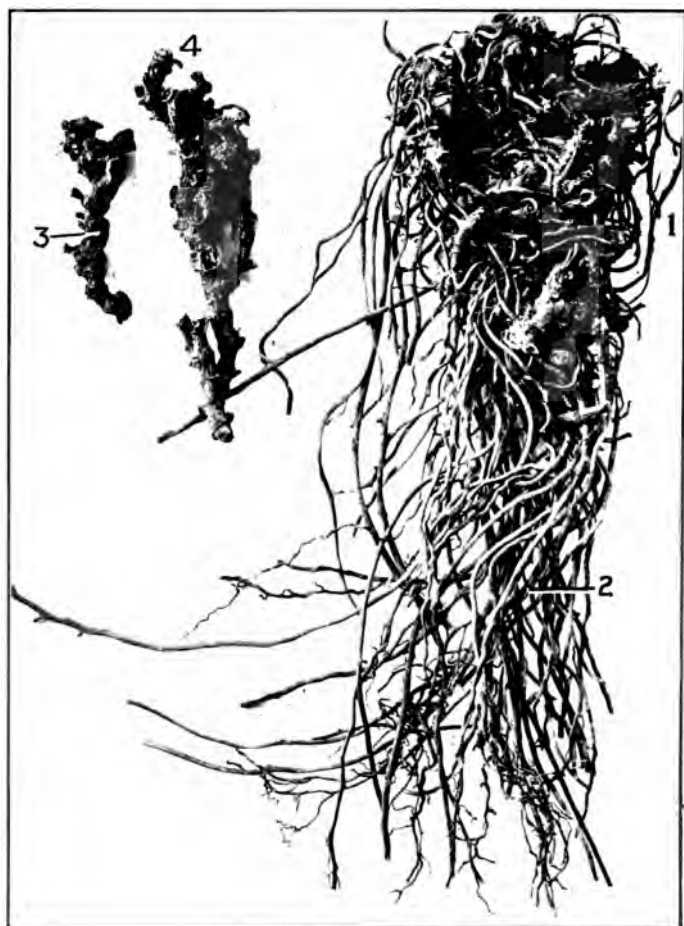
Hydrastis occurs as entire and as broken pieces of the rhizome and roots. The *rhizome* measures up to 6 cm. in length and to 18 mm. in diameter; the *roots* measure up to 30 cm. in length and to 3 mm. in diameter. The rhizome is horizontal and is simple or branched; the *upper surface* has many circular, slightly depressed stem scars, or short stem bases, or portions of stems. The *stems* are fibrous, longitudinally furrowed and greenish brown. They are surrounded at the base by numerous thin yellow scales. The *texture* is slightly fibrous. The *color* varies from yellowish to dark grayish or to reddish brown. The *surface* of the rhizome is annulate and longitudinally striated, that of the roots striated longitudinally. The *fracture* is very brittle and even. The *outline* of the rhizome and roots is cylindrical. The *cortex* of the rhizome is thick. The *wood* has several isolated masses of radial conducting cells and a greenish yellow pith. The *cortex* of the roots is yellowish green. The *wood* is minute and yellowish. The *odor* is slightly aromatic. The *taste* is bitter.

- **Constituents:** Alkaloids (hydrastine, berberine, canadine), fixed oil, starch, gum, sugar, coloring matter, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Extractum Hydrastis; Dose, 0.5 Gm. (8 grains).
Fluidextractum Hydrastis; Dose, 2 mls (30 min.).
Glyceritum Hydrastis; Dose, 2 mls (30 min.)
Tinctura Hydrastis; Dose, 4 mls (1 fl. dr.).



SPIGELIA

1, A large branched rhizome with numerous roots. 2, Branched root. 3, Stem scar. 4, A branched rhizome freed of roots.

SPIGELIA (Spig.) U. S. P.

English name: Spigelia.

Synonyms: Pink Root, Indian Pink.

Botanical origin: *Spigelia marilandica* Linné. (Fam. , *Loganiaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: New Jersey to Wisconsin, south to Florida and Texas.

Description:

Pink Root *occurs* as entire and as broken pieces of the rhizome and roots. The rhizomes measure up to 7 cm. in length and to 5 mm. in diameter. The roots measure up to 10 cm. in length. The *rhizomes* are branched, and they have numerous circular depressed stem scars and stem bases; the latter measure up to 1 cm. in length. The brittle branched roots grow from all parts of the rhizome. The *texture* is non-fibrous. The *color* of the rhizome and roots varies from grayish to brownish black and pinkish brown. The rhizome is usually darker than the roots. The *surface* of the rhizome is finely annulate, the *roots* finely striated longitudinally. The *fracture* is very weak, brittle and uneven. The *outline* of the rhizome and roots is cylindrical. The *cortex* of the rhizome is white, of the wood yellow. The *pith* is white. The roots have a white cortex and small central yellow wood. The *odor* is aromatic. The *taste* is sweet, pungent, bitter and slightly acrid.

Constituents: Spigeline (alkaloid), volatile oil, tannin, resin, etc.

Dose: 4 Gm. (60 grains).

Preparations:

Fluidextractum Spigeliae. Dose, 4 mls (1 fl. dr.).



SERPENTARIA—TEXAS

1, Rhizomes with roots. 2, Rhizome freed of roots showing contiguous stem bases. 3, Stems. 4, Fruit and three seeds. 5, A leaf.

SERPENTARIA (Serpent.) U. S. P.

(1) Texas Serpentaria

English name: Serpentaria.

Synonyms: Texas Snakeroot, Texas Serpentaria.

Botanical origin: *Aristolochia reticulata* Nuttall.
(Fam. *Aristolochiaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Louisiana to Arkansas, south to Texas.

Description:

Texas Serpentaria occurs as a mixture of the entire and broken pieces of the rhizome and root. The rhizomes measure up to 3 cm. in length and to 4 mm. in diameter. The roots measure up to 10 cm. in length and to 2 mm. in diameter. The rhizome is oblique and simple or branched. It has many contiguous stem bases, or longer stems with flowers or with fruits, or with strongly reticulately veined, cordate leaf blades. The texture is non-fibrous. The color varies from grayish to dark yellowish brown. The surface of the rhizome and stem bases is annulate, the surface of the roots smooth or slightly striated longitudinally, and occasionally fissured. The fracture is very weak, brittle and even. The outline of the cross-sections of the rhizome, stem bases and roots is cylindrical. The cortex of the rhizome is white, of the wood, yellow and very small. The odor is aromatic like turpentine. The taste is pungent and bitter.

Constituents: Volatile oil, bitter principle, tannin, starch, gum, resin, etc.

Preparations:

Fluidextractum Serpentariae N. F.; Dose, 1 mil (15 min.).
Tinctura Cinchonae Composita; Dose, 4 mils (1 fl. dr.).
Tinctura Serpentaria N. F.; Dose, 4 mils (1 fl. dr.).



SERPENTARIA—VIRGINIA

1, Rhizome with its mass of fine branching roots. 2, Leaf.
3, Seed. 4, Fruit with numerous seeds. 5, Rhizome freed
of roots.

SERPENTARIA (Serpent.) U. S. P.

(2) Virginia Serpentaria

English name: Serpentaria.

Synonyms: Virginia Snakeroot, Virginia Serpentaria.

Botanical origin: *Aristolochia Serpentaria* Linné.
(Fam. *Aristolochiaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Connecticut to Michigan, south to Florida and Missouri.

Description:

Virginia Serpentaria occurs as a mixture of entire and broken pieces of the rhizome and roots. The rhizome measures up to 2 cm. in length and to 2.5 mm. in diameter; the roots measure up to 12 cm. in length and to 1 mm. in diameter. The rhizome is oblique or simple, or branched. It has several short, contiguous stem bases, or stems with flowers or with fruit, or with an occasional leaf. The texture is non-fibrous. The color is yellowish brown. The surface of the rhizome and stem bases is finely annulate. The roots are finely striated longitudinally. The fracture is very neat, brittle and even. The outline of the rhizome, stem bases and roots is cylindrical. The cortex is grayish. The wood is yellowish. The cortex of the root is grayish, that of the wood minute and yellowish. The odor is aromatic like turpentine. The taste is pungent and bitter.

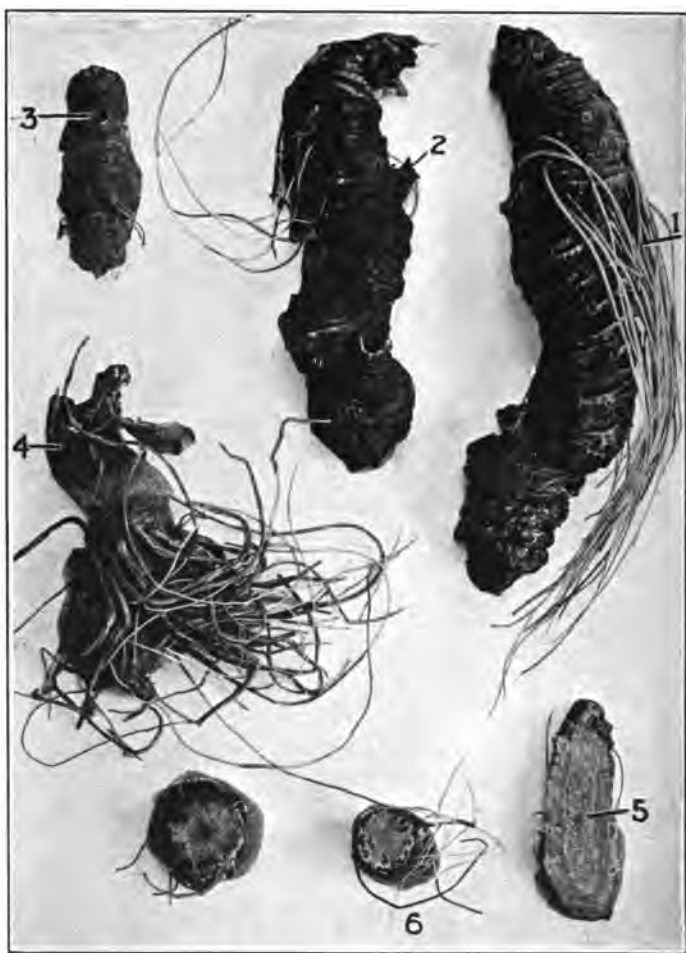
Constituents: Volatile oil, bitter principle, tannin, starch, sugar, gum, resin.

Preparations:

Fluidextractum Serpentariæ N. F.; Dose, 1 mil (15 min.).

Tinctura Cinchonæ Composita; Dose, 4 mils (1 fl. dr.)

Tinctura Serpentariæ N. F.; Dose, 4 mils (1 fl. dr.).



HELONIAS

1, Oblique rhizome with roots and prominent stem bases. 2, Stem base. 3, Surface view of stem base. 4, Leaf bases which are attached to young rhizomes. 5, Longitudinal section of rhizome. 6, Cross-section of the rhizome.

HELONIAS (Helon.) N. F.

English name: Helonias.

Synonyms: Blazing Star, False Unicorn.

Botanical origin: *Chamælorium luteum* (Linné) A. Gray. (Fam. *Liliaceæ*.)

Part used: Rhizome and roots.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Massachusetts to Ontario, to Michigan, south to Florida, and west to Arkansas.

Description:

Helonias occurs as a mixture of the entire and broken rhizomes and the roots. The rhizomes measure up to 7 cm. in length and to 15 mm. in diameter. The roots measure up to 9 cm. in length and to 2 mm. in diameter. Young rhizomes are erect; older rhizomes are oblique. Both the rhizomes and roots are simple. The stem scars are prominent and raised above the surface of the rhizome. The youngest portion of the rhizome has numerous yellowish imbricated leaf bases. The texture of both the rhizome and the root is resinous and fibrous. The outline of the rhizome and roots is cylindrical. The cortex, which is thick and yellowish gray, has brown cavities formed by decaying roots. The endodermis is distinct. The central cylinder has numerous grayish yellow groups of conducting tissue. The pith is central and dark yellowish brown. The odor is not characteristic. The taste is strongly bitter.

Constituents: Glucoside (chamælorin), etc.

Dose: 2 Gm. (30 grains).

Preparations;

Fluidextractum Heloniadis; Dose, 2 mls (80 min.).



ARALIA

1, Root with a wrinkled surface. 2, Rhizome with large contiguous stem scars. 3, Longitudinal section of the rhizome. 4, Longitudinal section of the root. 5, Cross-section of the root.

ARALIA (Aral.) N. F.

English name: Aralia.

Synonyms: American Spikenard Root, Spignet Root.

Botanical origin: *Aralia racemosa* Linné. (Fam. *Araliaceæ*.)

Part used: Rhizome and roots.

Impurities: Not more than 5 per cent. of adhering stem bases or other foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Canada to Florida, west to Rocky Mountains.

Description:

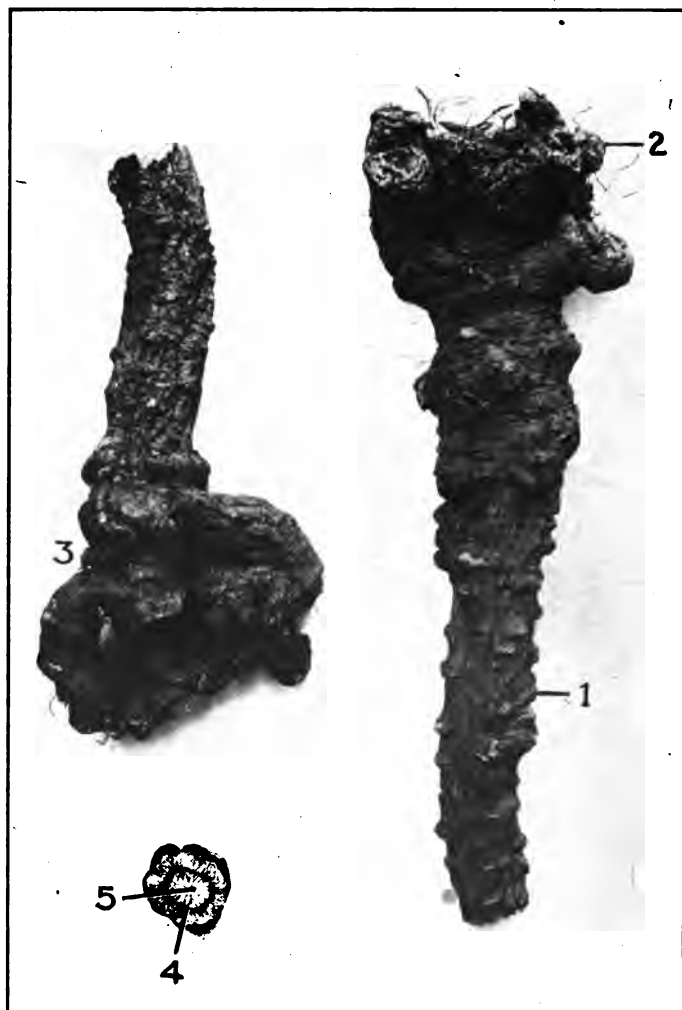
Aralia occurs as a mixture of broken and as cut slices of the rhizomes and roots. The rhizome measures up to 20 cm. in length and to 6 cm. in diameter. The roots measure up to 4 cm. in length and to 27 mm. in diameter. The rhizome is oblique, simple or branched, and has large, depressed, contiguous stem scars. The texture is fibrous. The color varies from pale yellow to deep purplish brown. The rhizome is rough and annulate between the stem scars. The roots are longitudinally furrowed and have transversely elongated ridges and root scars. The fracture of the cortex is brittle and even, that of the wood tough. When moist the root is pliable. The outline of sections is cylindrical or irregular. The cortex is thick and yellowish white and has brown oleoresin cavities; the tissue is irregularly porous when magnified. The cambium zone is distinct. The wood is yellowish, distinctly radiate and loosely arranged. The pith is white and porous. The odor is aromatic. The taste is sweet, pungent or acrid.

Constituents: Starch, pectin, sugar, resin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Araliae; Dose, 2 mls (30 min.).



PIMPINELLA

1, Nodulated surface of the root. 2, Crown with many stem bases. 3, Stem scar. 4, Dark cambium zone. 5, Wood.

PIMPINELLA (Pimpinell.) N. F.

English name: Pimpinella.

Synonyms: Pimpernel Root.

Botanical origin: *Pimpinella Saxifraga* Linné or
Pimpinella magna Linné. (Fam. *Umbelliferae*.)

Part used: Rhizome and roots.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Europe.

Description:

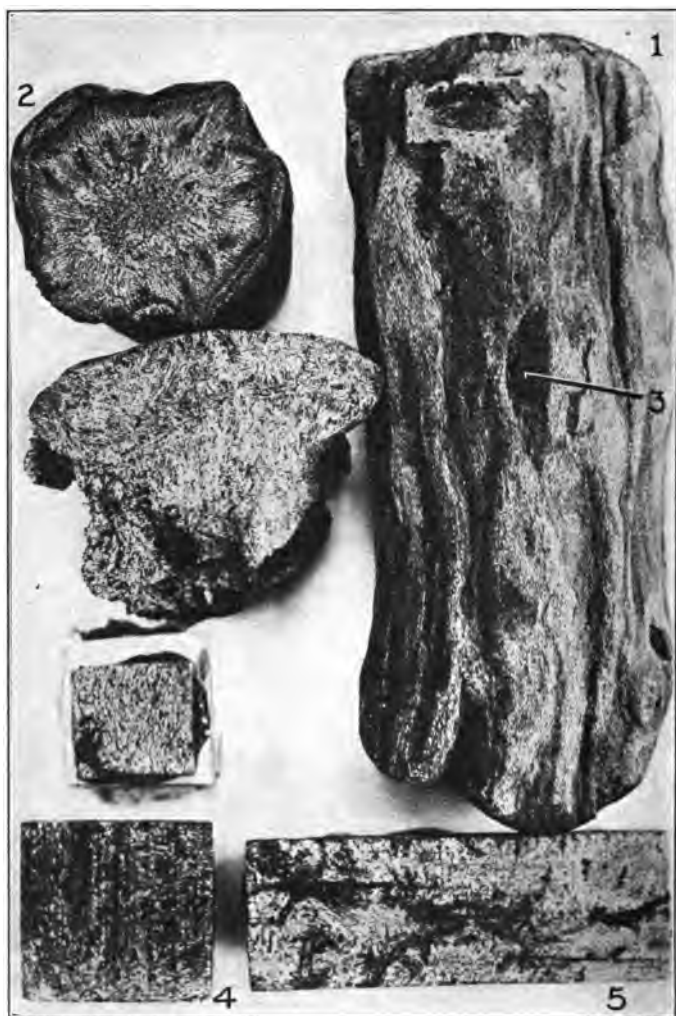
Pimpinella occurs as a mixture of entire, of broken pieces and of cut slices of the rhizome and root. They measure up to 18 cm. in length and to 3 cm. at the crown. The rhizome and root are vertical and oblique. The root is usually simple, but the crown is multiple. The stem scars are numerous, circular and depressed. The texture is non-fibrous. The color is light brownish yellow. The surface of the crown and its branches is annulate; the surface of the root is longitudinally striated, and both the crown and the root are slightly nodulated. The fracture is very weak, brittle and uneven when dry, but pliable when moist. The outline is nearly circular. The cortex is thick and has numerous groups of radially arranged brown phloem tissue. The cambium zone is distinct and dark brown. The wood is yellowish and radiate. The pith is small and light yellow. The odor is aromatic. The taste is sweet and pungent.

Constituents: Volatile oil, resin, benzoic acid, pimpinellin, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Tinctura Pimpinellæ; Dose, 4 mils (1 fl. dr.).



RHEUM

1, Large piece of the root showing the wrinkled and sunken surface. 2, Cross-section of a root. 3, Irregular perforation through which a string is passed in drying the drug. 4, Square of cut rhubarb. 5, Rectangular piece of the root.

RHEUM U. S. P.

English name: Rhubarb.

Synonyms: Rhubarb Root.

Botanical origin: *Rheum officinale* Baillon, *Rheum palmatum* Linné, and the var. *tanguticum* Maximowicz, and probably other species of *Rheum* grown in China and Thibet. (Fam. *Polygonaceæ*.)

Part used: Peeled rhizomes and roots.

Impurities: None given.

Assay: Yields not less than 30 per cent. of extractive to diluted alcohol.

Ash: Not more than 13 per cent.

Habitat: China and Thibet.

Description:

Rhubarb occurs as long transverse, or as oblique pieces, or as cubes, or as rectangular pieces of the peeled rhizome and roots. The pieces are always simple. Leaf scars or leaf bases are present. The pieces measure up to 15 cm. in length and to 15 cm. in width. The texture is fibrous and resinous. The color varies from yellowish to reddish brown. The surface is smooth, longitudinally wrinkled or sunken, and frequently has an irregular perforation, through which a string is inserted when the drug is dried. The root is very strong and tough, and requires a sharp blow to break it. The outline of sections is irregular. The cortex is thin. The wood is mottled with radial reddish brown medullary rays and yellowish white parenchyma tissue, or the mottling may be irregular. The pith in the larger pieces is dark brown. The odor is aromatic. The taste is bitter and astringent.

Constituents: Chrysophanic acid, emodin, rhein, tannin, glucoside (glucogallum), bitter principle, starch, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidglyceratum Rhei N. F.; Dose, 1 mil (15 min.). Mistura Rhei Alkalina N. F.; Dose, 4 mils (1 fl. dr.). Mistura Rhei Composita N. F.; Dose, 4 mils (1 fl. dr.). Pilulæ Rhei N. F.; Dose, 1 pill. Extractum Rhei; Dose, 0.25 Gm. (4 grains). Fluidextractum Rhei; Dose, 1 mil (15 min.). Pilulæ Rhei Compositæ; Dose, 2 pills. Pulvis Rhei Compositus; Dose, 2 Gm. (30 grains). Syrupus Rhei (from fluidextract); Dose, 10 mils (2½ fl. drs.). Syrupus Rhei Aromaticus (from aromatic tincture); Dose, 10 mils (2½ fl. drs.). Tinctura Rhei Aromatic; Dose, 4 mils (1 fl. dr.). Tinctura Rhei Aquosa N. F.; Dose, 4 mils (1 fl. dr.). Tinctura Rhei Dulcis N. F.; Dose, 2 mils (30 min.). Tinctura Rhei et Gentianæ N. F.; Dose, 4 mils (1 fl. dr.). Pulvis Rhei et Magnesiae Anisatus N. F.; Dose (for infants), 0.3 Gm. (5 grains). Vinum Rhei Compositum N. F.; Dose, 4 mils (1 fl. dr.).



KAVA

1, Irregular piece of the root. 2, Transverse section showing the radiate and slightly concentric wood. 3, Large pith.

KAVA (Kava) N. F.

English name: Kava.

Synonyms: Methysticum, Kava Kava.

Botanical origin: *Piper methysticum* Forster. (Fam. Piperaceæ.)

Part used: Rhizome and roots.

Impurities: None given.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Polynesian Islands.

Description:

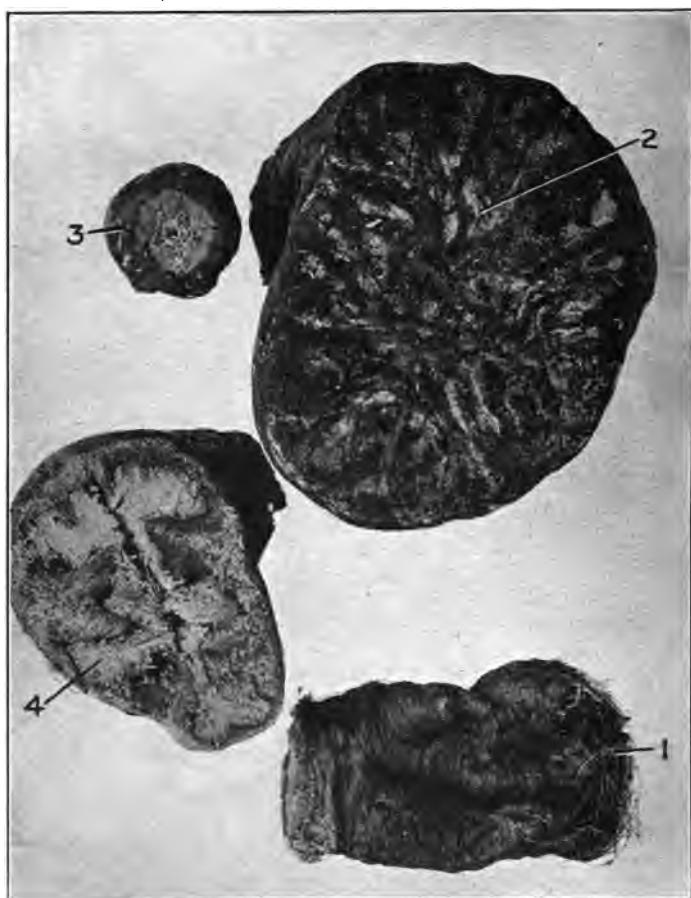
Kava occurs as a mixture of long-cut transverse and irregular-cut sections. The pieces measure up to 10 cm. in width and to 20 cm. in length. Portions of the cut stem have a central hollow pith. The texture is coarse, fibrous and starchy. The color varies from grayish brown to nearly black. The surface is longitudinally wrinkled and transversely annulate. The fracture is very strong, tough and uneven. The outline of the sections is irregular. The cortex is very thin. The wood is distinctly concentric or occasionally radiate. The pith is large, pinkish or yellowish gray and sunken. The odor is not characteristic. The taste is starchy, sweet, slightly bitter and pungent.

Constituents: Resins, methysticin, glucosides, alkaloid, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Kavæ; Dose. 1 mil (15 min.).



SUMBUL

- 1, Multiple crown with fibrous remains of stem bases.
2, A large resinous root. 3, Cross-section of a small root.
4, Branched and irregularly thickened wood.

SUMBUL (Sumb.) U. S. P.

English name: Sumbul.

Synonyms: Musk Root, Sumbul Root.

Botanical origin: *Ferula Sumbul* (Kauffmann)
Hooker filius. (Fam. *Umbelliferae*.)

Part used: Rhizome and roots.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Central and Northern Asia.

Description:

Sumbul occurs as a mixture of the long and short transverse sections of the rhizome and of the root. The pieces measure up to 20 cm. in length and to 12.2 cm. in width. The rhizome is vertical. The crown is branched, and so is an occasional root. The crown has numerous fibrous remains of stem bases. The texture is coarsely fibrous and resinous. The color of the rhizome and roots varies from grayish yellow to dark-reddish brown. The surface of the rhizome is annulate; of the roots, longitudinally wrinkled or smooth. The fracture is very strong, tough and uneven. The outline is cylindrical. The cortex is thick. In the older roots the thickness is variable. The wood is yellowish white in color and radiate and cylindrical. The odor is slightly aromatic. The taste is bitter or pungent.

Constituents: Volatile oil, resin, valeric and other acids, bitter extractive, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Extractum Sumbul; Dose, 0.25 Gm. (4 grains).
Fluidextractum Sumbul; Dose, 2 mls (30 min.).
Tinctura Sumbul N. F.; Dose, 4 mls (1 fl. dr.).

CHAPTER IV

TUBEROUS ROOTS, BULBS AND CORMS

IN the study of tuberous roots, bulbs and corms, the following must be considered: Occurrence, size, type, nature, stem bases or scars, texture, color, surface, fracture, outline, cortex, wood (central cylinder), odor and taste.

1. **Occurrence.** Aconite and corydalis occur in the entire condition; colchicum and squill and occasionally jalap occur in the cut condition.

2. **Size.** Of this class of drugs jalap is the largest. It frequently measures 11 cm. in diameter.

3. **Type.** Aconite, jalap and corydalis, the entire drugs, are vertical.

4. **Nature.** Aconite and jalap are frequently branched, the others are simple.

5. **Stem Bases or Scars.** Large stem bases are present in aconite and garlic. In colchicum the growth of the corm around the stem forms the groove or scar of the corm. In the others, the scars are not diagnostic.

6. **Texture.** The texture of jalap is resinous, of aconite and colchicum starchy and resinous, of scilla and corydalis mucilaginous.

7. **Color.** The color of aconite is grayish brown, of jalap reddish brown, of scilla yellowish white, of corydalis yellow to reddish brown, of allium white or pink, of colchicum brownish black.

8. **Surface.** The surface of aconite is wrinkled, of jalap furrowed, of scilla rough with projecting vascular bundles, of allium with striated scales, of corydalis granular, of colchicum rough.

9. **Fracture.** Jalap and corydalis are too tough to

be fractured; aconite, squill, allium and colchicum are brittle.

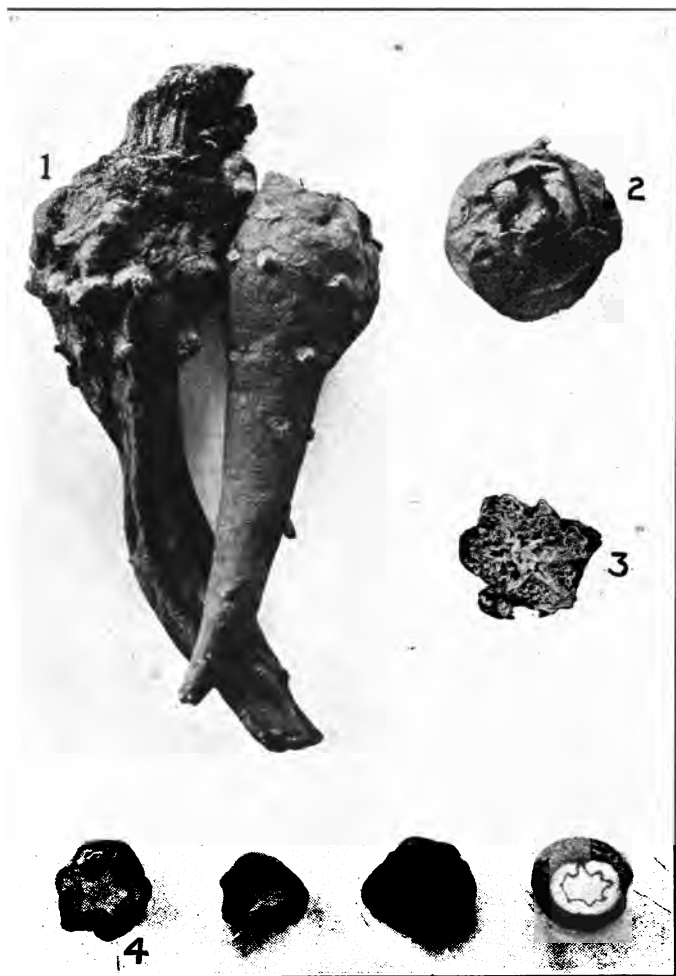
10. **Outline.** The outline of aconite is cylindrical or irregular, of jalap and sections of squill irregular; of corydalis, circular or irregular; of colchicum reniform or ovate.

11. **Cortex.** The cortex of aconite is thick, of jalap thin, of squill, corydalis and colchicum there is no distinct cortex.

12. **Wood and Central Cylinder.** In aconite, the wood is 5 to 7 angled, in jalap mottled, in squill not distinct, in corydalis and colchicum with oleoresin tubes.

13. **Odor.** The odor of jalap is smoky, of allium strongly aromatic; in the others it is not characteristic.

14. **Taste.** The taste of aconite is sweet, acrid and tingling; of jalap, sweet and acrid, of squill sweet, bitter and strongly pungent, of colchicum bitter and acrid.



ACONITUM

1, Cluster of two tuberous roots, the older one on the left. 2, Surface view of the crown. 3, Cross-section of an old shriveled root. 4, Cross-section showing 5, 6, 7, and 8-angled wood.

ACONITUM (Aconit.) U. S. P.

English name: Aconite.

Synonyms: Monkshood, Aconite Root.

Botanical origin: *Aconitum Napellus* Linné. (Fam. *Ranunculaceæ*.)

Part used: Tuberous roots.

Impurities: Not more than 5 per cent. of stems' or other foreign matter.

Assay: 0.5 per cent. of ether-soluble alkaloids.

B. A.—Minimum lethal dose should not be greater than 0.00004 mil for each gramme of body weight of guinea-pig.

Ash: Not more than 6 per cent.

Habitat: Mountainous regions of Europe and Asia; cultivated in England.

Description:

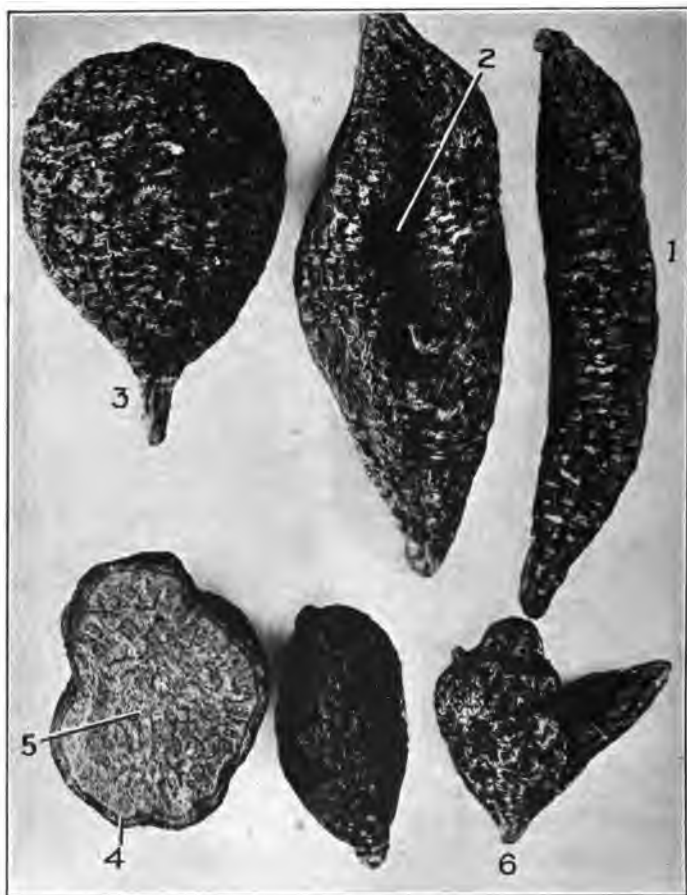
Aconite occurs as clusters of two and three tuberous roots, and as roots separated from clusters. The roots measure up to 11 cm. in length and to 3 cm. in width at the crown. The tuberous roots are fleshy or thickened roots. They are simple or rarely branched. The old shriveled rhizome has stem scars, or the basal portion of stems with a hollow pith. The texture is starchy or resinous. The color is gray to dark reddish brown. Roots which have produced stems, flowers, etc., are deeply wrinkled longitudinally and slightly twisted, and have large root scars and root fragments. The fracture is brittle and even. The outline is cylindrical or irregular. The cortex is thick and yellow or grayish brown. The cambium zone is distinct and yellow or brown. The wood is 5, 6, 7 or 8 angled, and in each angle there is a conducting strand. The pith is large and parenchymatic, gray and starchy, except in the older roots, where it is hollow or fissured and non-starchy. The odor is not distinct. The taste is sweet, acrid, tingling and numbing.

Constituents: Alkaloids (aconitine, benzaconine, aconine and napelline), aconitic acid, starch, resin, fat, sugar, etc.

Dose: 0.03 Gm. ($\frac{1}{2}$ grain).

Preparations:

Extractum Aconiti; Dose, 0.01 Gm. ($\frac{1}{6}$ grain).
Fluidextractum Aconiti; Dose, 0.03 mil ($\frac{1}{2}$ min.).
Linimentum Aconiti et Chloroformi N. F.
Tinctura Aconiti; Dose, 0.3 mil (5 min.).



JALAPA

1, An elongated root. 2, Sunken surface of the root.
 3, A typical black and gray surfaced root. 4, Cortex. 5,
 Mottled wood. 6, Branched tuberous root.

JALAPA (Jalap.) U. S. P.

English name: Jalap.

Synonyms: Jalap Root.

Botanical origin: *Exogonium Purga* (Wenderoth)
Bentham. (Fam. *Convolvulaceæ*.)

Part used: Tuberous root.

Impurities: None given in U. S. P.

Assay: Not less than 7 per cent. of total resins.

Ash: Not more than 6.5 per cent.

Habitat: Mexico; cultivated in Mexico and India.

Description:

Jalap occurs as the entire and cut pieces of tuberous roots, or is entire and partially cut longitudinally to aid in drying. Jalap varies in height up to 16 cm. and in width to 11 cm. The tuberous root is a fleshy, enlarged root. It is simple or branched. The upper end is tapering, and it has a rounded stem scar. The texture is hard and resinous. The color is dark reddish brown; the ridges are light gray or yellow. The surface is rough. This is caused by numerous short transverse ridges and by deep longitudinal furrows. The fracture cannot be made. The broken surface is uneven. The outline is irregular, rounded or oval. The cortex is thin and variable in thickness. The cambium zone is dark brown or black and distinct. The wood has dark brown threadlike strands of conducting tissue and grayish brown parenchymatic tissue. The odor is smoky. The taste is sweet and acrid.

Constituents: Resins (convolvulin, jalapin), sugar, gum, starch, coloring matter.

Dose: 1 Gm. (15 grains).

Preparations:

Extractum Jalapæ N. F.; Dose, 1 Gm. (15 grains).
Fluidextractum Jalapæ N. F.; Dose, 1 mil (15 min.).
Pilulæ Cathartice Compositæ (from Resin); Dose, 2 pills.
Pulvis Jalapæ Compositus; Dose, 2 Gm. (30 grains).
Resina Jalapæ; Dose, 0.125 Gm. (2 grains).
Tinctura Jalapæ N. F.; Dose, 4 mls (1 fl. dr.).
Tinctura Jalapæ Composita N. F.; Dose, 4 mls (1 fl. dr.).



SCILLA

- 1, Concentric slices of squill bulb. 2, Typical curved piece.
3, Irregular pieces of the bulb.

SCILLA (Scill.) U. S. P.

English name: Squill.

Synonyms: Squills, Squill Bulb.

Botanical origin: White variety of *Urginea maritima* (Linné) Baker. (Fam. *Liliaceæ*.)

Part used: Fleshy inner scales of the bulb.

Impurities: None given in U. S. P.

Assay: B. A.—Lethal dose should be not greater than 0.006 mil of tincture or the equivalent in tincture of 0.0000005 Gm. of ouabain for each gramme of frog.

Ash: 8 per cent. or less.

Habitat: Mediterranean basin.

Description:

Squill occurs as entire and broken concentric, transverse slices. Squill, when entire, is a tunicated bulb resembling the onion. The pieces measure up to 6 cm. in length and to 8 mm. in thickness. There are no stem bases or stem scars present in the drug. The texture is mucilaginous or gummy. The color varies from gray to whitish yellow. The uncut surface is smooth and dull. The cut surface is rough with projecting masses of conducting tissue, which usually occur parallel to and near the inner surface of the scale. The fracture is very weak and brittle when squill is dry, but pliable when it is moist. The outline of the sections is irregular. The cortex and stele are not clearly defined in the scales. The odor is slight. The taste is sweet, bitter and acrid.

Constituents: Volatile oil, sugar, mucilage, glucosides (scillin, scillipicrin, scillitoxin), etc.

Dose: 0.1 Gm. (1½ grains).

Preparations:

Acetum Scillæ; Dose, 1 mil (15 min.).

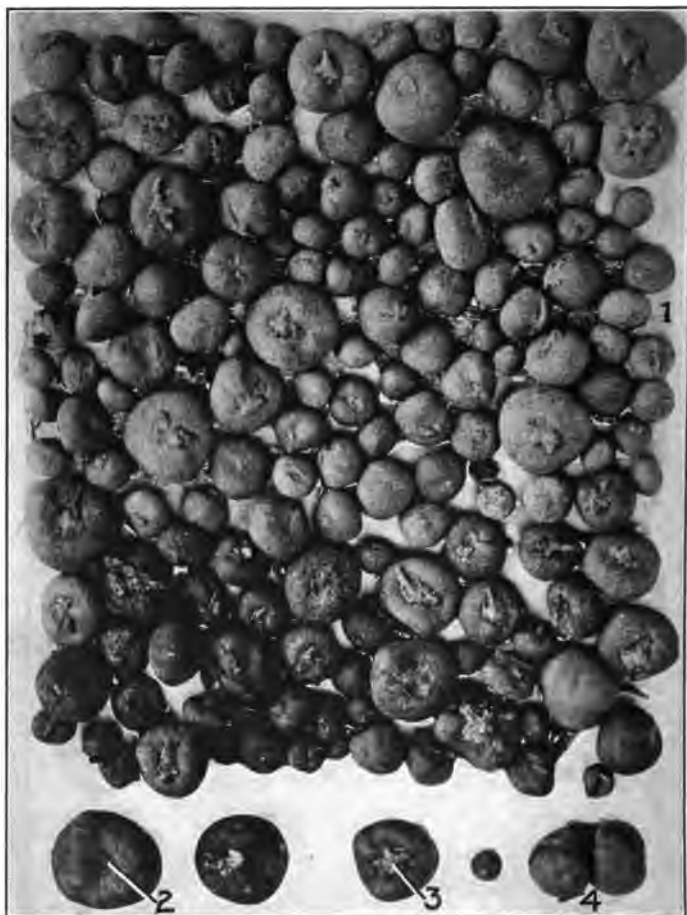
Fluidextractum Scillæ; Dose, 0.1 mil (1½ min.).

Oxymel Scillæ N. F.; Dose, 4 mils (1 fl. dr.).

Syrupus Scillæ (from vinegar); Dose, 2 mils (30 min.).

Syrupus Scillæ Compositus (from fluidextract); Dose, 2 mils (30 min.).

Tinctura Scillæ; Dose, 1 mil (15 min.).



CORYDALIS—TURKEY CORN

1, Many tubers of variable form. 2, Triangular scar on the upper side of the tuber. 3, Branched rhizome bearing tuber. 4, United tubers.

CORYDALIS (Coryd.) N. F.

(1) Turkey Corn

English name: Corydalis.

Synonyms: Turkey Corn, Round Turkey Corn, Squirrel Corn.

Botanical origin: *Bicuculla canadensis* (Goldie) Millspaugh. (Fam. *Fumariaceæ*.)

Part used: Dried tubers.

Impurities: Not more than 5 per cent. of other parts of the plants or other foreign matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Nova Scotia to Minnesota, south to North Carolina and Missouri.

Description:

Round turkey corn *occurs* as entire, separated tubers, and rarely as united tubers. These tubers measure up to 16 mm. in diameter and to 8 mm. in height. The tubers are vertical and about twice as wide as they are high. The upper surface is marked with a triangular, depressed scar or scale. The *texture* is gummy, horny, and starchy. The *color* varies from yellowish to reddish and brownish black. The *surface* of the tubers is smooth, but granular in appearance, because it has small depressions. The *upper surface* is concave and has a triangular scar. The *under surface* is concave and with portions of the slender, branched rhizome with stem bases. The *fracture* cannot be made. The broken surface is even. The *surface* frequently is whitish yellow and has yellow resin cavities with resin. The *outline* of the section is circular or oval. The *cortex* and *stele* are not distinct. The *odor* is not characteristic. The *taste* is bitter.

Constituents: Alkaloids (corydaline, bulbocarpnine, etc.), fumaric acid, bitter extractive, resin, starch, etc.

Dose: 0.65 Gm. (10 grains).

Preparations:

Elixir Corydalis Compositum; Dose, 4 mls (1 fl. dr.).
Fluidextractum Corydalis; Dose, 0.65 mil (10 min.).



CORYDALIS—DUTCHMAN'S BREECHES

1, Numerous scaly bulbs of variable size and form. 2, Rhizome bearing bulbs. 3, Outer thick concave scale. 4, Surface view of bulb.

CORYDALIS (Coryd.) N. F.

(2) Dutchman's Breeches

English name: Corydalis.

Synonyms: Dutchman's Breeches, Soldier's Cap.

Botanical origin: *Bicuculla Cucullaria* (Linné) Millspaugh. (Fam. *Fumariaceæ*.)

Part used: Scaly bulbs.

Impurities: Not more than 5 per cent. of other parts of the plant or other foreign matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Nova Scotia to Minnesota, south to Georgia, and west to Nebraska.

Description:

Dutchman's breeches occurs as the entire and as separated parts of the scaly bulb. The whole bulbs measure up to 2 cm. in width and to 17 mm. in height. The bulbs are usually scaly, having two large outer scales and one small central scale. No stem scars or stems occur on the fleshy scales, because the stems originate from the slender, branched rhizome, which has a number of stem bases. The texture is gummy, or horny and starchy. The color varies from light yellow to dark grayish or reddish brown. The upper surface terminates in a pointed, triangular, scale-like scar and tapers downward; the inner surface is concave. The under surface is tapering and is attached to a slender, branched rhizome with numerous stem bases. The fracture cannot be made. The broken surface is even. The outline of sections is irregular; the outer surface of the scales is convex; the inner surface is concave. The cortex and stele of the scales are not distinguishable. The surface resembles a mass of gum, or is granular and starchy with small, resin cavities. The odor is not characteristic. The taste is bitter.

Constituents: Alkaloids (corydaline, bulbocarpnine, etc.), fumaric acid, bitter extractive, resin, starch, etc.

Dose: 0.65 Gm. (10 grains).

Preparations:

Elixir Corydalis Compositum; Dose, 4 mls (1 fl. dr.).
Fluidextractum Corydalis; Dose, 0.65 ml (10 min.).



ALLIUM

1, A large bulb. 2, A bulb with the outer scale removed to show smaller bulbs. 3, Stem growing from the center of the compound bulb. 4, Disk-like base of the compound bulb. 5, Single bulb. 6, Cross-section of the bulb showing the scattered conducting strands.

ALLIUM (Alli.) N. F.

English name: Garlic.

Synonyms: Allium.

Botanical origin: *Allium sativum* Linné. (Fam. *Liliaceæ*.)

Part used: Fresh bulb.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Central Asia; cultivated extensively; Italy is a large producer.

Description:

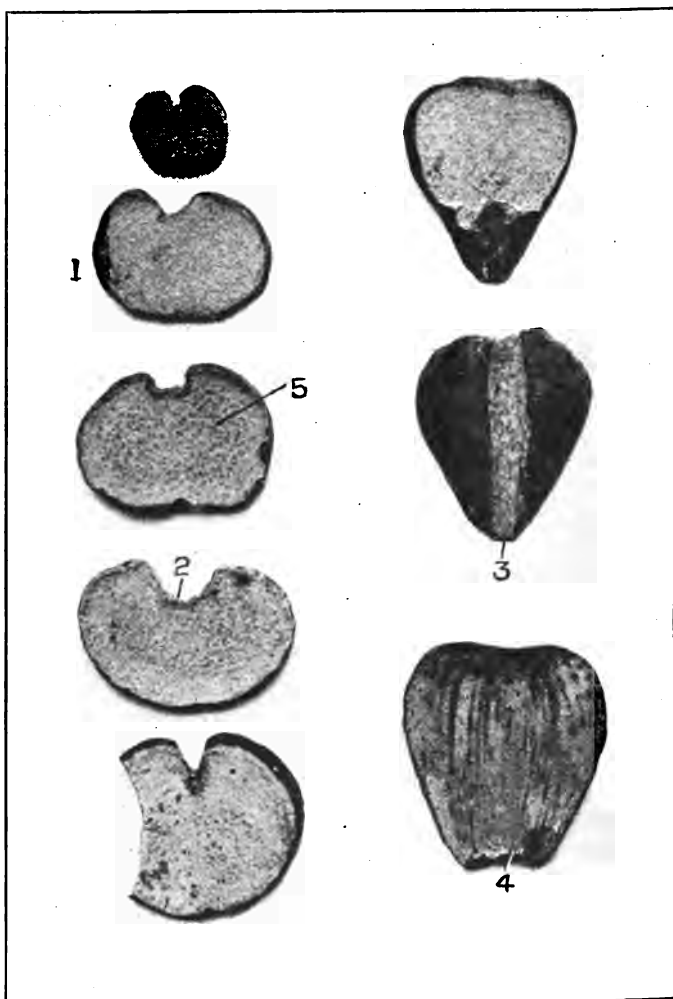
Allium occurs as long-braided strands of entire bulbs. The bulbs measure 5 cm. or less in length and 5.7 cm. or less in diameter. The bulbs are vertical and compound, and they are outgrowths of the branched, flattened rhizome. The smooth, white stems measure 6 cm. or less in length. The texture is moist and non-fibrous. The color varies from white to pink. The surface of the scales covering the compound and individual bulbs has many elevated, vascular strands. The bulbs are brittle and the fracture is even. The outline of the entire bulb is cylindrical, of the smaller bulbs irregular. There is no distinction into cortex and central cylinder, but the vascular strands show distinctly. The odor is very strongly and persistently aromatic. The taste is very strongly pungent.

Constituents: Mucilage, albumin, sugar, starch, volatile oil, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Syrupus Allii N. F.; Dose, 4 mls (1 fl. dr.).



COLCHICI CORMUS

1, Reniform section of the corm. 2, Groove formed by the growing stem. 3, Longitudinal section showing the groove formed by the growing stem. 4, Longitudinal section showing parallel lines of resin tissue. 5, Round resin masses.

COLCHICI CORMUS (Colch. Corm.) U. S. P.

English name: Colchicum Corm.

Synonyms: Colechicum Root.

Botanical origin: *Colchicum autumnale* Linné. (Fam. *Liliaceæ*.)

Part used: Corm.

Impurities: None given.

Assay: Not less than 0.35 per cent. of colchicine.

Ash: Not more than 6 per cent.

Habitat: Germany, Austria and England.

Description:

Colchicum corm occurs as a mixture of transverse and longitudinal slices of the cormus. These slices measure up to 3.5 cm. in width or length and to 1 cm. in thickness, but usually less than 5 mm. in thickness. The rhizome is vertical and deeply grooved on one side. Stem bases are never present, but the groove is caused by the stem, which originates underneath and then grows along the side of the corm. The texture is resinous and starchy. The color of the uncut surface is yellowish or brownish black. The uncut surface is smooth and indistinctly striated. The fracture is weak, brittle and even. The outline of the transverse slices is reniform, of the longitudinal slices broadly ovate and truncate. The cortex and stele are not distinguishable. The transverse sections have numerous round resin masses, while longitudinal sections have parallel resin masses. The color of the cut surfaces varies from grayish white to brown. The odor is not characteristic. The taste is starchy, bitter and acrid.

Constituents: Colchicine (alkaloid), resin, fat, starch, etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

Extractum Colchici Cormi; Dose, 0.06 Gm. (1 grain).

Fluidextractum Colchici Cormi N. F.; Dose, 0.2 mil (3 min.).

Vinum Colchici Cormi N. F.; Dose, 0.65 mil (10 min.).

CHAPTER V

BARKS

IN the study of barks the following must be considered: Occurrence, size, nature, outer surface, inner surface, fracture and tenacity, fractured surface, odor and taste.

1. **Occurrence.** This refers to the condition of the bark, whether broken pieces, as sassafras and most barks, or cut, as cinchona.

2. **Size.** The length of pieces of bark varies from a few millimeters up to 3 dm., as in mezereum. The width varies from a few millimeters up to 5 dm., as in white pine bark. The thickness varies from less than a millimeter up to 10 mm., as in canella.

3. **Nature.** This refers to the form of the bark, whether flat or chip-like, as in cornus; or flat or slab-like, as in elm bark and soap bark; or partially quilled—i.e., the outer edges curved upward, as in chionanthus; or quilled—i.e., the outer bark edges just coming together and touching, as in condurango; or overlapping quilled—i.e., one edge of the bark curved or rolled inside of the other edge, as in cascara sagrada; or double quilled—i.e., two quills formed by the rolling inward of the two longitudinal edges of the bark, as in cascara sagrada; or multiple quilled—i.e., a quill composed of several quills or overlapping quills, one within the other, as in Ceylon cinnamon.

4. **Outer Surface.** The study of the outer surface embraces the color as well as the markings. The color of the outer surface of the different barks varies greatly, but each bark has a characteristic color.

The Markings of the Outer Surface. The surface is *striated* when it has parallel markings caused by variable coloration, as in Ceylon cinnamon, or by very

shallow parallel elevations and depressions, as in paracoto; *furrowed* when it has sharply defined parallel elevations and depressions, as in red cinchona; *wrinkled* when it is irregularly contracted into furrows, as in cinchona; *fissured* when it has narrow openings caused by a separation of the tissues during drying. The surface is *fissured longitudinally* when the fissures occur parallel to the length of the bark, as in cocillana bark; or *transversely* fissured when they occur crosswise or at right angles to the length of the bark, as in cascarilla bark; or *irregularly fissured* when they occur irregularly, as in quebracho.

Elevations of the surface include lenticels, corky elevations, and thorns, or a combination of cork and thorns. Lenticels vary in form, size, color and arrangement. The most common forms are the circular lenticels, as in juglans; and the lens-shaped lenticels, as in wild cherry bark. The size of lenticels varies greatly in the different barks. The color of lenticels varies greatly. In cramp bark they are brown; in southern prickly ash bark they are yellowish; in canella and in peeled wild cherry bark they are nearly white.

The arrangement of lenticels is variable. In frangula, as in most barks, they are scattered or irregularly arranged; in wild cherry they occur in parallel transverse lines. Corky elevations with or without thorns occur on the surface of southern prickly ash bark.

The outer surface of wahoo bark shows numerous V-shaped yellowish masses of tissue. The surface of butternut is layered. Quebracho has a reddish brown outer layer and an inner yellowish layer; in cinchona and red cinchona and cocillana the outer layer is granular, the inner, fibrous; condurango has long projecting bast fibers; in southern prickly ash bark the surface is radiate.

5. Inner Surface. The study of the inner surface embraces the color and the markings. The color of the inner surface of barks is variable. The most common shades are grays, yellows, reds and browns. In

most cases the color is a mixture. The most common of all is yellowish brown, which varies in intensity in the different barks. Quebracho, frangula, black haw, ulmus, white pine, and Ceylon cinnamon have a yellowish brown inner surface, yet in each the shade is sufficiently variable to be recognizable. Reddish brown is the color of the inner surface of cinchona, red cinchona, paracoto, wild cherry and Saigon cinnamon. Cascara and frangula are frequently purplish brown. The color of granatum, cramp bark, and xanthoxylum is greenish yellow. Canella and quillaja are yellowish white. Mezereum is greenish gray, etc.

The Markings of the Inner Surface. In cascara the surface is smooth, or free of markings. In soap bark and canella the surface is granular.

In most barks the surface is dull and striated. The striations may be fine and short striated, as in cornus; or coarse and short, as in quercus; or fine and long striated, as in mezereum; or coarse and long striated, as in ulmus; or irregularly striated, as in quebracho.

The surface is fissured, as in wild cherry bark and in red cinchona.

The surface is corrugated, as in white pine bark.

The surface is scaly, as in northern prickly ash and in cramp bark.

In cocillana the tissue of the inner bark separates into layers. In cotton root bark, ulmus, condurango, quercus and in mezereum the fibers become detached and project from the surface.

The inner surface of cotton root bark has numerous black oleoresin cavities.

FRACTURE AND TENACITY

Fracture Tenacity. The fracture may be even, as in granatum; uneven, as in cascara; conchoidal, as in granatum; or hackly, as in cinchona.

6. Tenacity. By tenacity is meant the resistance which a bark offers to tearing stresses.

For the purpose of study the barks are divided into

three classes according to their tenacity. 1. Barks too tough to be fractured—*i.e.*, barks that have no fracture, as in mezereum and cotton root. 2. Barks that have an incomplete fracture—*i.e.*, that break part way, as in elm bark, white pine, white oak, blackberry bark, cocillana, butternut, soap bark, and white ash. 3. Barks that can be fractured. These barks are divided into six classes: (1) Very weak brittle barks; (2) weak brittle barks; (3) brittle barks; (4) tough barks; (5) very tough barks; (6) strong tough barks.

The very weak brittle barks include cramp bark, black haw stem bark, Ceylon cinnamon, and cascarilla.

The weak brittle barks include euonymus, northern prickly ash, wild cherry, cornus, and sassafras.

The brittle barks include black haw root bark, cascara, pomegranate, southern prickly ash, and frangula.

The tough barks include red cinchona, cinchona, canella, condurango, fringe-tree bark, and bayberry bark.

The strong tough barks include quebracho and paracoto.

The very strong tough barks are those cited above as having an incomplete, or as having no fracture.

7. **Fractured surfaces** show projecting fibers, as in cocillana; projecting stone cells in groups, as in fringe-tree bark; or pits, as in fringe-tree bark.

8. **Odor.** Most barks have no characteristic odor. Exceptions are paracoto, canella, black haw (slight), cascarilla, ulmus, Saigon cinnamon, Ceylon cinnamon, fringe-tree, and sassafras, which have aromatic odors that are diagnostic for each drug.

9. **Taste:** Most barks have a succession of tastes—*i.e.*, bitter and astringent, as in quebracho, cinchona, red cinchona, cornus, and euonymus; sweet and pungent, as in Ceylon cinnamon and Saigon cinnamon, etc.

Those barks having simple tastes (one taste) include quercus and granatum, which are astringent; soap bark, which is acrid; and paracoto, which is pungent.



CORNUS

1, Scaly outer surface of the bark. 2, Flat, finely striated inner surface. 3, Small chip-like piece. 4, Irregular fragment of the bark.

CORNUS (Corn.) N. F.

English name: Cornus.

Synonyms: Flowering Dogwood, Dogwood Bark.

Botanical origin: *Cornus florida* Linné. (Fam. *Cornaceæ*.)

Part used: Bark of the root.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Maine to Ontario, south to Florida and Mexico.

Description:

Cornus occurs as a mixture of the broken longitudinal pieces of the bark. These pieces vary in size up to 8 cm. in length, and to 2.6 cm. in width. The pieces are mostly flat or curved outward. The *outer surface* is gray or reddish brown where the cork has been removed, and is rough, scaly and frequently abraded. The *inner surface* is striated because of slightly projecting groups of fibrous tissue. The *color* is deep purplish brown. The *fracture* is weak, brittle and uneven. The *fractured surface* has projecting fibers and is bright purplish brown. The *odor* is not characteristic. The *taste* is bitter and astringent.

Constituents: Bitter principle (cornin), resin, fixed oil, gallic acid, tannin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Corni; Dose, 2 mls (80 min.).



CHIONANTHUS

1, Outer surface of the bark, slightly annulate above. 2, Longitudinally striated inner surface. 3, Circular lenticel. 4, Cross-section showing small pits and groups of stone cells.

CHIONANTHUS (Chionant.) N. F.

English name: Chionanthus.

Synonyms: Flowering Ash, Fringe Tree Bark.

Botanical origin: *Chionanthus virginica* Linné. (Fam. Oleaceæ.)

Part used: Bark of the root.

Impurities: Not more than 8 per cent. of other parts of the plant or other foreign matter.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Pennsylvania, south to Florida and Texas.

Description:

Fringe Tree Bark occurs as irregular broken pieces. These pieces measure up to 13 cm. in length, to 5.5 cm. in width, and to 8 mm. in thickness. The pieces of bark may be nearly flat and partially quilled, and quilled. The outer surface varies in color from grayish yellow to grayish brown. It is rough, annulate, and frequently pitted, or it has circular lenticels. The inner surface varies in color from grayish to yellowish to reddish brown. It is longitudinally striated. The fracture of the bark is tough and uneven. The fractured surface is yellowish white. It has numerous pits and projecting masses of stone cells. The odor is aromatic. The taste is very bitter.

Constituents: Glucoside, bitter principle, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Chionanthi; Dose, 2 mls (30 min.).



EUONYMUS

1, Deeply furrowed outer surface. 2, Bark from a smaller root. 3, Smooth, finely striated inner surface. 4, Out edge of the bark.

EUONYMUS (Euonym.) N. F.

English name: Euonymus.

Synonyms: Burning Bush, Wahoo Bark.

Botanical origin: *Euonymus atropurpureus* Jacquin.
(Fam. *Celastraceæ*.)

Part used: Dried bark of the root.

Impurities: Not more than 3 per cent. of wood or other foreign matter.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Southeastern United States, west to Arkansas and Indian Territory.

Description:

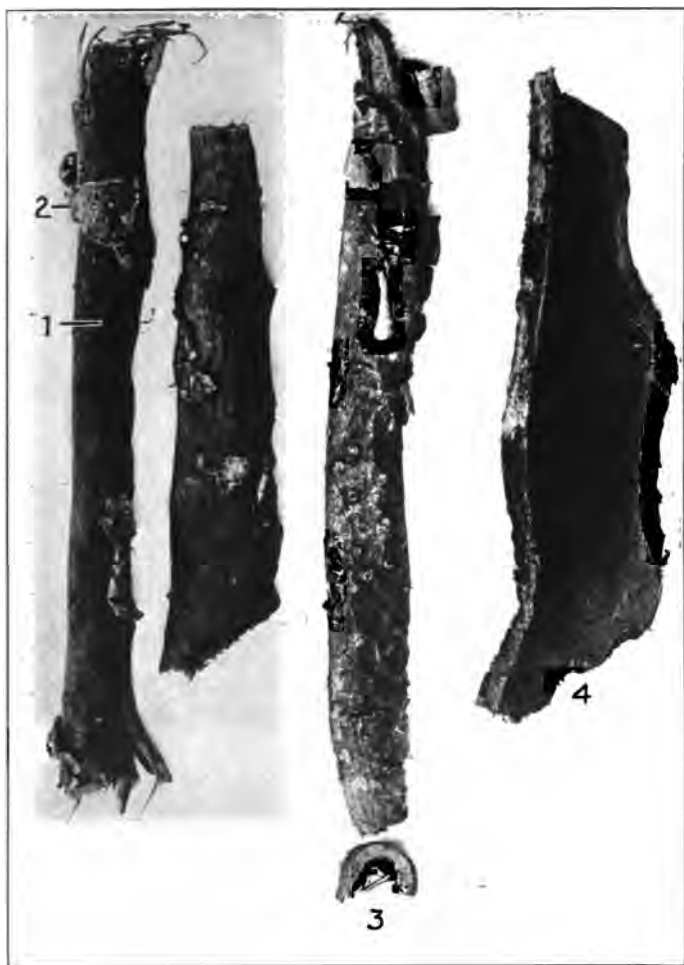
Euonymus occurs as irregular broken pieces. These pieces measure up to 11 cm. in length, to 5 cm. in width, and to 6 mm. in thickness. The pieces of bark may be partially quilled, or quilled. The *outer surface* varies in color from a yellowish gray to grayish brown, and it is nearly smooth, or deeply furrowed longitudinally. The *inner surface* is yellowish brown and smooth to the touch, but is finely striated. The *fracture* is weak and brittle. The *fractured surface* shows numerous interrupted V-shaped masses of nearly white tissue alternating with the yellowish brown tissue which makes up the remaining part of the bark. The *odor* is not characteristic. The *taste* is slightly sweet, bitter and acid.

Constituents: Bitter principle (euonymin), acids, fixed and volatile oils, resins, wax, pectin, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Extractum Euonymi; Dose, 0.125 Gm. (2 grains).
Fluidextractum Euonymi; Dose, 0.5 mil (8 min.).



MYRICA

1, Portion of the bark without the corky layer. 2, Piece of the corky layer. 3, Cross-section of the bark. 4, A thick piece of the bark.

MYRICA N. F.

English name: Bayberry Bark.

Synonyms: Wax Myrtle, Candleberry.

Botanical origin: *Myrica cerifera* Linné. (Fam. *Myricaceæ*.)

Part used: Dried bark of root.

Impurities: Not more than 5 per cent. of adhering wood.

Assay: None given.

Ash: None given.

Habitat: Maryland to Arkansas, south to Florida and Texas.

Description:

Bayberry occurs as irregular broken pieces. These pieces measure up to 15 cm. in length, to 2 cm. in width and to 4 mm. in thickness. The pieces are partially quilled, or quilled. The outer surface is grayish yellow and smooth, and has cylindrical elevated lenticels. The bark without the corky layer is smooth or finely striated and reddish brown. The fracture is tough and uneven. The fractured surface is yellowish brown and has numerous projecting bast fibers. The odor is not characteristic. The taste is astringent, pungent and pepper-like.

Constituents: Volatile oil, coloring matter, tannin, resins, gum, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Pulvis Myricæ Compositus; Dose, 1 Gm. (15 grains).



GOSSYPII CORTEX

1, Scaly outer surface of the bark. 2, Tangled mass of the tough bark.

GOSSYPII CORTEX (Gossyp. Cort.) N. F.

English name: Cotton Root Bark.

Synonyms: None.

Botanical origin: *Gossypium herbaceum* Linné, *Gossypium Barbádense* Linné, or *Gossypium arboreum* Linné. (Fam. *Malvaceæ*.)

Part used: Air-dried bark of the root.

Impurities: Not more than 5 per cent. of wood or other foreign matter.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Virginia to Arkansas, south to Florida and Texas; also cultivated.

Description:

Cotton root bark *occurs* as a mixture of the tangled masses of bent and twisted pieces of bark. These pieces measure up to 6 cm. in length, to 1 cm. in width and to 1.5 mm. in thickness. The bark may be flat or partially quilled, and quilled. The *outer surface* is orange or reddish brown. This surface is rough, scaly and transversely fissured. The *inner surface* is yellowish brown, and it has many small black cylindrical oleoresin cavities and many detached masses of fibers. The bark is so very strong, tough and fibrous that it bends when pressure is applied. It, therefore, has no fracture. The *odor* is not characteristic. The *taste* is astringent and acid.

Constituents: Starch, glucose, gum, fixed oil, tannin, acid, resin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Gossypii Corticis; Dose, 2 mls (30 min.).



JUGLANS

1, Bark from a small root. 2, Lenticels on bark from an old root. 3, Cross-section of thin bark. 4, Dark outer part of the thick bark. 5, Light inner part of the thick bark. 6, Out surface of bark.

JUGLANS (Juglan.) N. F.

English name: Juglans.

Synonyms: Butternut Bark, White Walnut Bark.

Botanical origin: *Juglans cinerea* Linné. (Fam. *Juglandaceæ*.)

Part used: Dried inner bark of roots.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Eastern United States and Canada, south to Georgia and Arkansas.

Description:

Juglans occurs as a mixture of the elongated cut and broken pieces. These *pieces* measure up to 40 cm. in width and to 10 mm. in thickness. The bark may be flat or partially quilled, and quilled. The *outer surface* varies from gray to brownish black. It is smooth in the thinner bark, rough in the thicker bark with detached pieces of cork, and has many rounded, elevated lenticels or transversely elongated depressed scars of lenticels. The *inner surface* is smooth and finely striated. The *fracture* is very strong, tough and incomplete. The *fractured* or *cut surface* is frequently layered. The outer layers are darker than the inner layer. The surface of the thinner barks is uniformly colored brownish black. The *odor* is slightly aromatic. The *taste* is slightly sweet, astringent and acid.

Constituents: Fixed and volatile oils, resin, mucin, gum, tannin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Juglandis; Dose, 4 mls (1 fl. dr.).



SASSAFRAS

- 1, Large piece of bark showing corky layer. 2, Root scar.
3, Large root scar. 4, Irregular pieces of the bark.

SASSAFRAS (Sassaf.) U. S. P.

English name: Sassafras.

Synonyms: Sassafras Bark, Ague Tree Bark.

Botanical origin: *Sassafras variifolium* (Salisbury)
O. Kuntze. (Fam. *Lauraceæ*.)

Part used: Peeled bark of the root.

Impurities: Not more than 2 per cent. of adhering wood.

Assay: None given.

Ash: Not more than 30 per cent.

Habitat: Maine to Michigan, south to Florida and Texas.

Description:

Sassafras occurs as a mixture of the cut or broken pieces of the peeled root bark. These pieces or quills measure up to 14 cm. in length, to 3 cm. in width and to 5 mm. in thickness. The bark may be flat or partially quilled, and quilled. The *outer surface* of the peeled bark varies in color from orange to reddish brown. The unpeeled portions are light gray. It is rough, slightly scaly, and has one or more prominent root scars and remains of roots. The *inner surface* is, if uncut, finely striated; if cut, it is rough. The *fracture* is weak, brittle and even. The *fractured or cut surface* varies in color from light-yellow to reddish-brown, and it frequently has prominent groups of bast fibers. The *odor* is aromatic. The *taste* is astringent, pungent and mucilaginous.

Constituents: Volatile oil, tannin, starch, resin and sassafrid, etc.

Dose: 10 Gm. (2½ drachms).

Preparations:

Fluidextractum Sarsaparillæ Compositum; Dose, 2 mls (30 min.).
Oleum Sassafras; Dose, 0.2 mil (3 min.).



RUBUS

1, A long, bent and twisted piece of bark. 2, Wood which is usually present. 3, Dark outer surface of the bark.

RUBUS N. F.

English name: Rubus.

Synonyms: Blackberry Bark.

Botanical origin: *Rubus villosus* Aiton, *Rubus nigrobaccus* Bailey or *Rubus cuneifolius* Pursh. (Fam. Rosaceæ.)

Part used: Dried bark of the rhizome.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Europe, New England to Florida, west to Arkansas.

Description:

Rubus occurs as a mixture of the broken pieces. These pieces measure up to 4 dm. in length, to 10 mm. in width and to 2 mm. in thickness. The bark is usually partially quilled, and quilled. The outer surface varies in color from gray to reddish brown. The surface without cork is light yellowish gray. It is longitudinally striated. The inner surface is long, finely striated and fissured. The color is light grayish yellow. The bark is so very strong, tough and fibrous that it bends instead of breaking when pressure is applied. Therefore it has no fracture. The odor is indistinct. The taste is slightly sweet and strongly astringent.

Constituents: Tannic acid, gallic acid, villosin (saponin), resin, volatile and fixed oils, wax, etc.

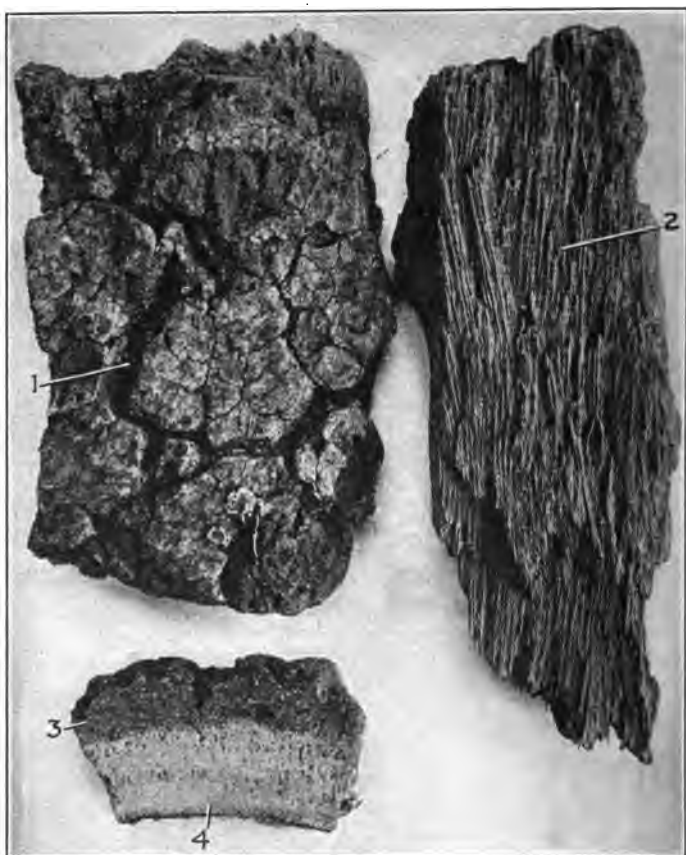
Dose: 1 Gm. (15 grains).

Preparations:

Elixir Rubi Compositum; Dose, 15 mls (4 fl. drs.).

Fluidextractum Rubi; Dose, 1 mil (15 min.).

Syrupus Rubi; Dose, 4 mls (1 fl. dr.).



ASPIDOSPERMA

1, Deeply fissured outer surface. 2, Irregularly and coarsely striated inner surface. 3, Dark reddish-brown layer of the bark. 4, Light yellowish layer of the bark.

ASPIDOSPERMA (Aspidosp.) U. S. P.

English name: Aspidosperma.

Synonyms: Quebracho Bark.

Botanical origin: *Aspidosperma Quebracho blanco*
Schlechtendal. (Fam. *Apocynaceæ*.)

Part used: Bark.

Impurities: Not more than 2 per cent. wood or other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Argentina, South America.

Description:

Quebracho Bark *occurs* as broken pieces. These pieces measure up to 16 cm. in length, to 7 cm. in diameter, and to 37 mm. in thickness. The bark is flat or chip-like and partially quilled. The *outer surface* is rough, irregularly and deeply fissured and it varies in color from light gray to reddish brown. The *inner surface* is irregularly and coarsely striated, and its color varies from light yellow to yellowish brown. The bark is tough, fibrous and too tenacious to be fractured. The *broken surface* has an outer reddish brown corky layer and an inner light yellowish or reddish brown layer. Both the outer and inner layers are pitted. The *odor* is not distinct. The *taste* is strongly bitter and pungent.

Constituents: Tannin, sugars (quebrachit, inosit), alkaloids (aspidospermine, quebrachine, etc.), etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Aspidospermatis; Dose, 4 mls (1 fl. dr.).



CINCHONA

1, Outer surface showing furrows, lichens and transverse fissures. 2, Striated inner surface of the bark. 3, Cross-section of quilled bark. 4, Fragment of old root bark. 5, Outer surface of the root bark.

CINCHONA (Cinch.) U. S. P.

English name: Cinchona.

Synonyms: Yellow Cinchona, Calisaya Bark, Yellow Peruvian Bark.

Botanical origin: *Cinchona Ledgeriana* Moens, *Cinchona Calisaya* Weddell, and hybrids of these with other species of *Cinchona*. (Fam. *Rubiaceæ*.)

Part used: Dried bark.

Impurities: None given in U. S. P.

Assay: Not less than 5 per cent. of alkaloids.

Ash: None given.

Habitat: South America; cultivated extensively in Jamaica, Java and India.

Description:

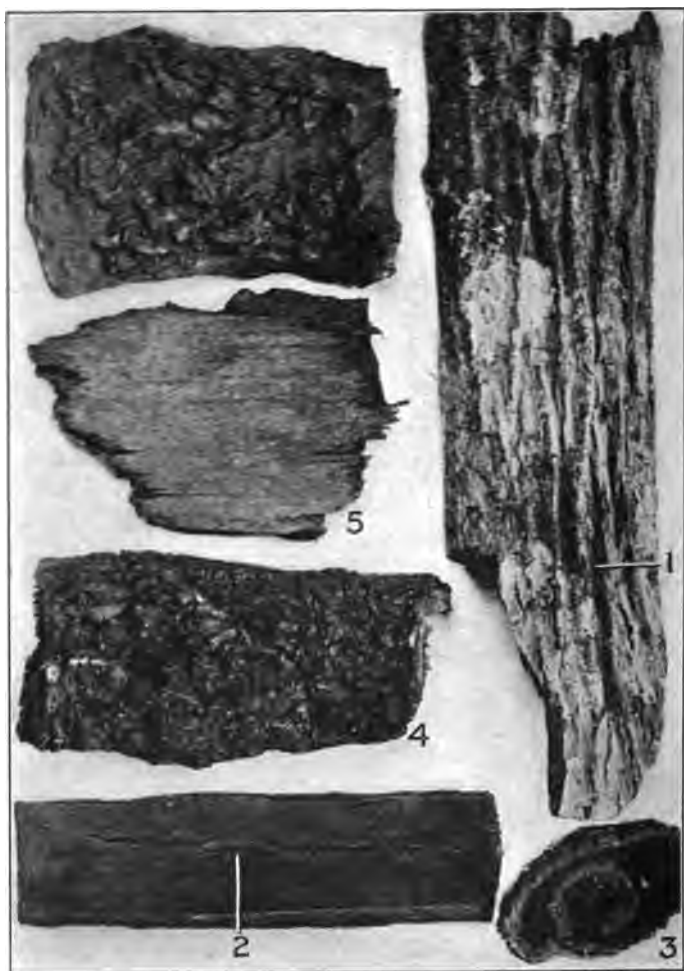
Cinchona occurs as a mixture of the long-cut pieces or broken fragments. These pieces measure up to 10.8 dm. in length and to 11 mm. in thickness. The bark is chip-like, partially quilled, quilled, overlapping quilled or compound quilled. The outer surface of the stem bark is rough, longitudinally furrowed and fissured, and transversely fissured, and the color varies from light gray to dark gray, with brownish black spots caused by lichens with apothecia or fruiting bodies. The root bark is rough, scaly, wrinkled and fissured, and the color is reddish brown. The inner surface is shortly and finely striated, and the color varies from a yellowish to a reddish brown. The fracture is tough and uneven. The fractured surface is granular in the outer portion, fibrous in the inner portion, and the color is brownish yellow. The odor is not characteristic. The taste is very bitter and astringent.

Constituents: Alkaloids (quinine, quinidine, cinchonine, cinchonidine, quinamine, etc.), acids, coloring matter, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Elixir Cinchonæ Alkaloidorum N. F.; Dose, 8 mls (2 fl. drs.).
Elixir Cinchonæ Alkaloidorum et Ferri N. F.; Dose, 8 mls (2 fl. drs.).
Elixir Cinchonæ Alkaloidorum et Hypophosphitum N. F.; Dose, 8 mls (2 fl. drs.).
Elixir Cinchonæ Alkaloidorum, Ferri, Bismuthi et Strychninæ N. F.; Dose, 4 mls (1 fl. dr.).
Elixir Cinchonæ Alkaloidorum, Ferri et Bismuthi N. F.; Dose, 8 mls (2 fl. drs.).
Elixir Cinchonæ Alkaloidorum, Ferri et Calcii Lactophosphatis N. F.; Dose, 8 mls (2 fl. drs.).
Elixir Cinchonæ Alkaloidorum, Ferri et Pepsini N. F.; Dose, 8 mls (2 fl. drs.).
Elixir Cinchonæ Alkaloidorum, Ferri et Strychninæ N. F.; Dose, 4 mls (1 fl. dr.).
Extractum Cinchonæ N. F.; Dose, 0.25 Gm. (4 grains).
Fluidextractum Cinchonæ; Dose, 1 mil (15 min.).
Infusum Cinchonæ N. F.; Dose, 50 mls (1½ fl. ozs.).
Tinctura Cinchonæ; Dose, 4 mls (1 fl. dr.).



CINCHONA RUBRA

1, Outer surface of stem bark showing deep longitudinal furrows and numerous lichens. 2, Fissured and finely striated inner surface. 3, Cross-section of stem bark. 4, Outer surface of root bark. 5, Inner surface of root bark.

CINCHONA RUBRA (Cinch. Rub.) U. S. P.

English name: Red Cinchona.

Synonyms: Red Peruvian Bark.

Botanical origin: *Cinchona succirubra* Pavon, or its hybrids. (Fam. *Rubiaceæ*.)

Part used: Dried bark.

Impurities: None given officially.

Assay: Not less than 5 per cent. of alkaloids of red cinchona.

Ash: None given.

Habitat: South America, Ecuador.

Description:

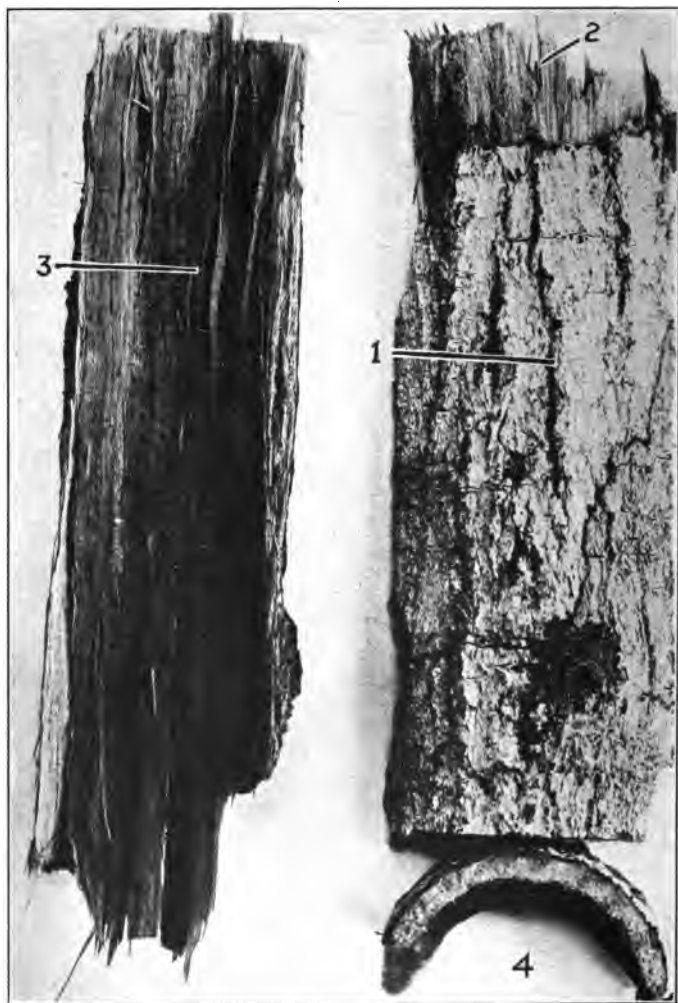
Red cinchona occurs as a mixture of cut and broken pieces. The pieces of stem bark measure up to 10.8 dm. in length, to 7 cm. in width and to 6 mm. in diameter. The root, which is nearly always chip-like, frequently measures up to 8 mm. in thickness. The bark is flat or chip-like, partially quilled, quilled, overlapping quilled or compound quilled. The outer surface of the stem bark is longitudinally furrowed, shallowly fissured transversely, or in the older barks deeply fissured transversely; and the color varies from light gray, when lichens are present, to grayish brown. The outer surface of the root bark is rough, wrinkled, and varies in color from a yellowish brown to brownish black. The inner surface of both the stem and root bark is finely striated and frequently fissured. The fracture is tough and uneven. The fractured surface is granular in the outer portion and fibrous in the inner portion. The color varies from yellowish to reddish brown. The odor is not distinct. The taste is strongly bitter and astringent.

Constituents: Alkaloids (quinine, quinidine, cinchonine, cinchonidine, quinamine, etc.), acids, coloring matter, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Cinchonæ Aquosum N. F.; Dose, 1 ml (15 min.).
Tinctura Cinchonæ Composita; Dose, 4 mls (1 fl. dr.).



COCILLANA

- 1, Longitudinal fissures and lichens on the outer surface.
- 2, Fibrous inner layer of the bark. 3, Fissured inner layer.
- 4, Cross-section of the bark.

COCILLANA (Cocillan.) N. F.

English name: Cocillana.

Synonyms: Guapi Bark.

Botanical origin: *Guarea Rusbyi* (Britton) Rusby.
(Fam. *Meliaceæ*.)

Part used: Dried bark.

Impurities: None given officially.

Assay: None given.

Ash: Not less than 10 per cent.

Habitat: Bolivia, South America.

Description:

Cocillana Bark occurs as broken and cut pieces. These pieces measure up to 6.5 dm. in length, to 10 cm. in width and to 2 cm. in thickness. The bark is partially quilled or quilled. The *outer surface* is deeply fissured longitudinally and shallowly fissured transversely, and is usually covered with gray lichens. The *color* varies from light yellowish gray to grayish brown. The *inner surface* is finely striated longitudinally and is easily separable into fibrous layers. The color is brownish yellow. The *fracture* is strong, tough and incomplete if pressure is applied to the inner surface, but complete if pressure is applied to the outer surface. The *fractured outer surface* is granular, the *inner* is fibrous and the *color* is light yellow. The *odor* is not distinct. The *taste* is slightly sweet, astringent and pungent.

Constituents: Resins, fat, tannin, alkaloids (rusbyine), etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Cocillanæ; Dose, 1 mil (15 min.).



PARACOTO

1, Outer surface of the bark. 2, Striated inner surface.

PARACOTO (Paracot.) N. F.

English name: Paracoto.

Synonyms: None in common use.

Botanical origin: Unidentified tree indigenous to Northern Bolivia.

Part used: Dried bark.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 3 per cent.

Habitat: Northern Bolivia and other parts of South America.

Description:

Paracoto occurs as a mixture of the broken pieces of the bark. These pieces measure up to 7 cm. in width and to 15 mm. in thickness, and are of variable length. The bark is usually partially quilled. The *outer surface* is fissured and furrowed transversely, occasionally longitudinally, and the color is reddish brown. The *inner surface* is coarsely striated and reddish brown. The *fracture* is strong, tough and uneven. The *fractured surface* is granular in the outer portion and fibrous and porous in the inner portion. Both portions have numerous glistening resin cavities. The color is reddish brown. The *odor* is aromatic. The *taste* is pungent and pepper-like.

Constituents: Volatile oil, tannin, glucosides, resin, starch, etc.

Dose: 0.3 Gm. (5 grains).

Preparations:

Fluidextractum Paracoto; Dose, 0.3 mil (5 min.).
Tinctura Paracoto; Dose, 2 mils (30 min.).



CONDURANGO

1, A quill of thick root bark. 2, Lenticel of the root bark.
3, Stem bark with lichens. 4, Granular and porous cross-section.

CONDURANGO (Conduran.) N. F.

English name: Condurango.

Synonyms: Condurango Bark.

Botanical origin: *Marsdenia Condurango* (Triana)
Reichenbach filius. (Fam. *Asclepiadaceæ*.)

Part used: Bark.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Ecuador and other parts of South America.

Description:

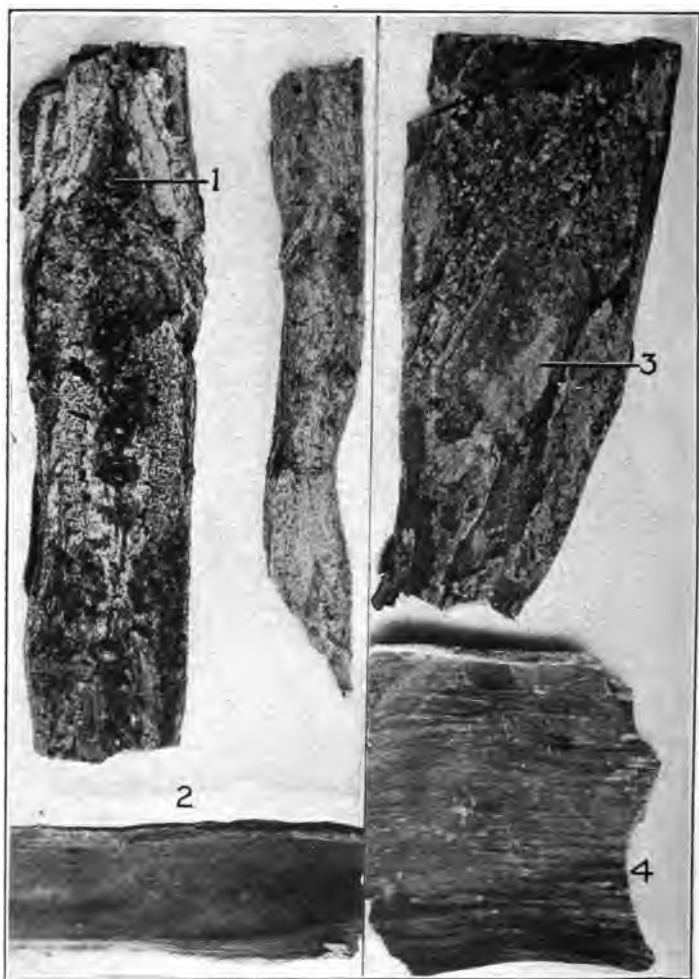
Condurango occurs as broken pieces of the bark. Thin stem bark measures up to a meter in length. The thicker stem and root bark measure up to 16 cm. in length, to 3 cm. in width, and to 7 mm. in thickness. The bark is quilled and partially quilled. The *outer surface* of the stem bark is rough and has numerous lenticels, a few longitudinal fissures, and gray lichens. The *color* is greenish gray or grayish brown. The root bark is rough, with numerous rounded lenticels, and the color is yellowish or reddish brown. The *inner surface* of both the stem and root bark is finely striated longitudinally, and in color is light grayish or pinkish yellow. The *fracture* is tough and uneven. The *fractured surface* is granular and porous and has numerous long, tough, projecting, bast fibers. The *color* is yellowish. The *odor* is slightly aromatic. The *taste* is slightly sweet, bitter and pungent.

Constituents: Starch, sugar, wax, resin, tannin, glucoside (condurangin), etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Condurango; Dose, 4 mls (1 fl. dr.).



GRANATUM

1, Stem bark showing fissures, lenticels and numerous small black apothecia. 2, Inner surface of the stem bark. 3, Root bark showing scars caused by detached cork. 4, Inner surface of the root bark.

GRANATUM (Granat.) U. S. P.

English name: Pomegranate.

Synonyms: Pomegranate Bark, Granatum Bark.

Botanical origin: *Punica Granatum* Linné. (Fam. *Punicaceæ*.)

Part used: Bark.

Impurities: Not more than 2 per cent. of wood or foreign matter.

Assay: None given.

Ash: Not more than 16 per cent.

Habitat: Southwestern Asia and Southern Europe, Japan, China; cultivated in subtropics, also in Florida.

Description:

Granatum occurs as broken pieces. These pieces measure up to 14 cm. in length, to 4.5 cm. in width, and to 5 mm. in thickness. The bark is flat, and is quilled and partially quilled. The *outer surface* of the stem bark has shallow fissures, which are narrow in the thin pieces of bark, but broad in the thicker pieces. The fissured surface is yellowish and the unfissured surface is gray. This gray portion has numerous purplish apothecia. The root bark is rough and often has large scars where a portion of the cork has become detached. The *color* is yellow or greenish yellow. The *inner surface* of both the stem and root bark is smooth and finely striated, and it varies in color from yellow to greenish yellow. The *fracture* is brittle and even. The *fractured surface* is finely granular and grayish yellow. The *odor* is not distinct. The *taste* is astringent.

Constituents: Tannin, gallic acid, mannit, yellow coloring matter, alkaloids (pelletierine, isopelletierine, etc.), etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Granati; Dose, 2 mls (80 min.).



FRANGULA

1, Outer surface showing indistinct lenticels and lichens. 2, Piece of bark with prominent lenticels. 3, Shiny, finely striated and split inner surface. 4, Cross-section of an overlapping quilled bark.

FRANGULA (Frang.) U. S. P.

English name: Frangula.

Synonyms: Buckthorn Bark.

Botanical origin: *Rhamnus Frangula* Linné. (Fam. *Rhamnaceæ*.)

Part used: Bark.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Europe, Northern Asia and Northern Africa.

Description:

Frangula occurs as a mixture of the cut and broken pieces. These pieces measure up to 5.5 dm. in length, but are usually shorter, to 4.7 cm. in width, and to 2 mm. in diameter, or rarely up to 3 mm. The bark is quilled and overlapping quilled, rarely multiple quilled. In each case the quills may be flattened. The *outer surface* has numerous rounded or transversely elongated gray lenticels and irregular patches of gray lichens. The *color* varies from light gray to purplish brown. The *inner surface* is smooth, finely striated and frequently split. The *color* varies from yellowish to purplish to reddish brown. The *fracture* is brittle. The *fractured surface* has many long, white, projecting groups of bast fibers in the outer portion. The *inner portion* is nearly smooth and has a few short projecting groups of bast fibers. The *color* varies from purple in the outer layer to yellow in the middle layer and yellowish brown in the inner layer. The *odor* is not distinct. The *taste* is slightly sweet and bitter.

Constituents: Frangulin (glucoside), resin, tannin, emodin, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Elixir Catharticum Compositum N. F.; Dose, Aperient, 4 mls (1 fl. dr.); Cathartic, 12 mls (3 fl. drs.).

Fluidextractum Frangulæ; Dose, 1 mil (15 min.).



CANELLA

1, Outer surface of the transversely wrinkled bark with large lenticels. 2, Inner surface of the stem bark. 3, Overlapping quilled bark. 4, Cross-sections of an overlapping, partially quilled and flat piece of bark; the latter is distinctly layered.

CANELLA (Canell.) N. F.

English name: Canella.

Synonyms: White Cinnamon, Wild Cinnamon.

Botanical origin: *Canella Winterana* (Linné) Gaertner. (Fam. *Canellaceæ*.)

Part used: Peeled bark.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: West Indies and Florida Keys.

Description:

Canella occurs as a mixture of cut and broken pieces of the peeled bark. These pieces measure up to 1 m. in length, to 8.5 cm. in width, and to 1 cm. in thickness. The bark is partially quilled, quilled, and overlapping quilled. The *outer surface* varies in color from pinkish yellow to brownish orange; it is transversely wrinkled and occasionally cleft; it has numerous large lenticels with a light outer ring and a darker central portion. The *inner surface* is whitish yellow, non-striated and granular. The *fracture* is tough and uneven. The *fractured surface* is granular, yellowish white on the outer and inner surface, brownish between. The thicker bark is distinctly layered. The *odor* is aromatic. The *taste* is sweet, pungent and aromatic.

Constituents: Mannit, mucilage, resin, bitter extractive, starch, volatile oil, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Pulvis Aloes et Canellæ; Dose, 0.3 Gm. (5 grains).



VIBURNUM PRUNIFOLIUM

1, Outer surface of the root bark. 2, Inner surface of the root bark. 3, Outer surface of thin stem bark showing prominent lenticels. 4, Fissured thick stem bark.

VIBURNUM PRUNIFOLIUM (Viburn. Prun.)
U. S. P.

English name: Viburnum Prunifolium.

Synonyms: Black Haw.

Botanical origin: *Viburnum prunifolium* Linné and
Viburnum Lentago Linné. (Fam. *Caprifoliaceæ*.)

Part used: Bark.

Impurities: Not more than 5 per cent. of wood or
other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Connecticut to Michigan, south to Georgia
and Arkansas.

Description:

Viburnum prunifolium occurs as a mixture of broken and cut pieces. These pieces measure up to 15 cm. in length, to 2 cm. in width and to 3 mm. in thickness. The bark may be chip-like, partially quilled, and quilled. The *outer surface* of the stem bark varies in color from light gray to nearly black; the thin pieces are smooth and have brown lenticels; the thicker pieces are rough and fissured, and are without lenticels; the inner surface is yellowish brown and striated. The root bark varies in color from yellowish brown to black; it is smooth with elevated lenticels, or rough with projecting groups of bast fibers. The *inner surface* is yellowish brown and striated. The *fracture* of both barks is very weak, brittle and uneven. The *fractured surface* is grayish white and fibrous. The *odor* is aromatic. The *taste* is bitter, slightly pungent, and astringent.

Constituents: Starch, tannin, resin, glucoside (viburnin), valeric acid, etc.

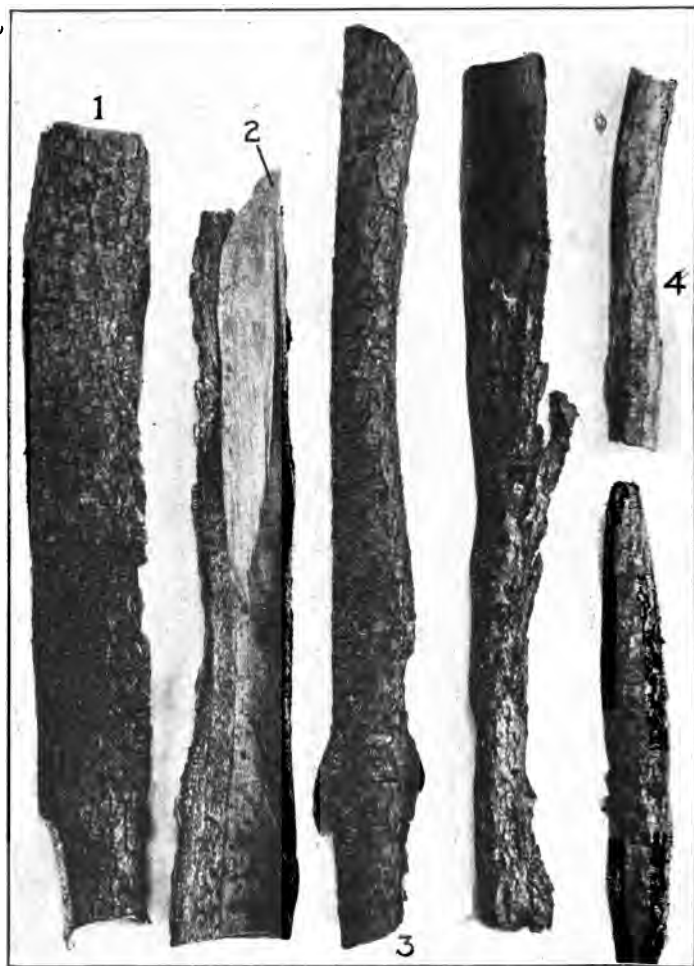
Dose: 2 Gm. (30 grains).

Preparations:

Elixir Viburni Prunifolii N. F.; Dose, 4 mls (1 fl. dr.).

Extractum Viburni Prunifolii; Dose, 0.5 Gm. (8 grains).

Fluidextractum Viburni Prunifolii; Dose, 2 mls (30 min.).



VIBURNUM OPULUS

1, Outer surface of thick stem bark. 2, Inner surface of stem bark showing adhering wood. 3, Medium thick bark. 4, Thin bark.

VIBURNUM OPULUS (Viburn. Opul.) N. F.

English name: Viburnum Opulus.

Synonyms: Cramp Bark, High Bush Cranberry Bark.

Botanical origin: *Viburnum Opulus* Linné var. *Americanum* (Miller) Aiton. (Fam. *Caprifoliaceæ*.)

Part used: Bark.

Impurities: Not more than 5 per cent. of wood and other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Northern North America, south to New Jersey, west to Oregon.

Description:

Viburnum opulus occurs as a mixture of broken and cut pieces. These pieces measure up to 30 cm. in length, to 3 cm. in width and to 3 mm. in diameter. The bark may be chip-like, partially quilled, and quilled. The *outer surface* of the thin pieces is yellowish gray; it frequently has short, shallow, longitudinal purple fissures and small brown lenticels. The thicker bark varies in color from grayish brown to purplish brown to brownish black; it has numerous shallow, longitudinal fissures and numerous brown lenticels. The *inner surface* varies from light greenish yellow to dark brown; it is finely striated longitudinally and fragments of wood are sometimes present. The *fracture* is very weak and brittle. The *fractured surface* is brown in the outer layer, yellow in the middle layer, and yellowish brown in the inner layer. The *odor* is aromatic, resembling valerianic acid. The *taste* is slightly astringent and bitter.

Constituents: Starch, tannin, resin, glucoside (viburnin), valeric acid, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Elixir Viburni Opuli Compositum; Dose, 4 mls (1 fl. dr.).

Fluidextractum Viburni Opuli; Dose, 2 mls (30 min.).

Tinctura Viburni Opuli Composita; Dose, 4 mls (1 fl. dr.).



MEZEREUM

1, Outer surface showing prominent lenticels. 2, Inner smooth satin-like surface. 3, Small bundle formed by folding the bark lengthwise and tying with pieces of the bark.

MEZEREUM (Mezer.) U. S. P.

English name: Mezereum.

Synonyms: Mezereon, Spurge Olive.

Botanical origin: *Daphne Mezereum* Linné, *Daphne Gnidium* Linné, or *Daphne Laureola* Linné.
(Fam. *Thymeleaceæ*.)

Part used: Bark.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Europe and Northern Asia.

Description:

Mezereum occurs as long, cut pieces of the bark. These pieces measure up to 1.2 m. in length, to 2.5 cm. in width and to 1 mm. in thickness. The bark is partially quilled, quilled, and overlapping quilled, and is frequently arranged in a small bundle. The outer surface varies in color from yellowish brown to purplish gray; it is smooth or has short, longitudinal wrinkles and large scattered light-colored lenticels and buds. The inner surface varies in color from gray to yellowish gray to greenish gray; it is finely striated longitudinally and is shiny like satin. There is no fracture. The bark bends when pressure is applied. The cut surface shows fine, silky fibers. The odor is not distinct. The taste is pungent and acrid.

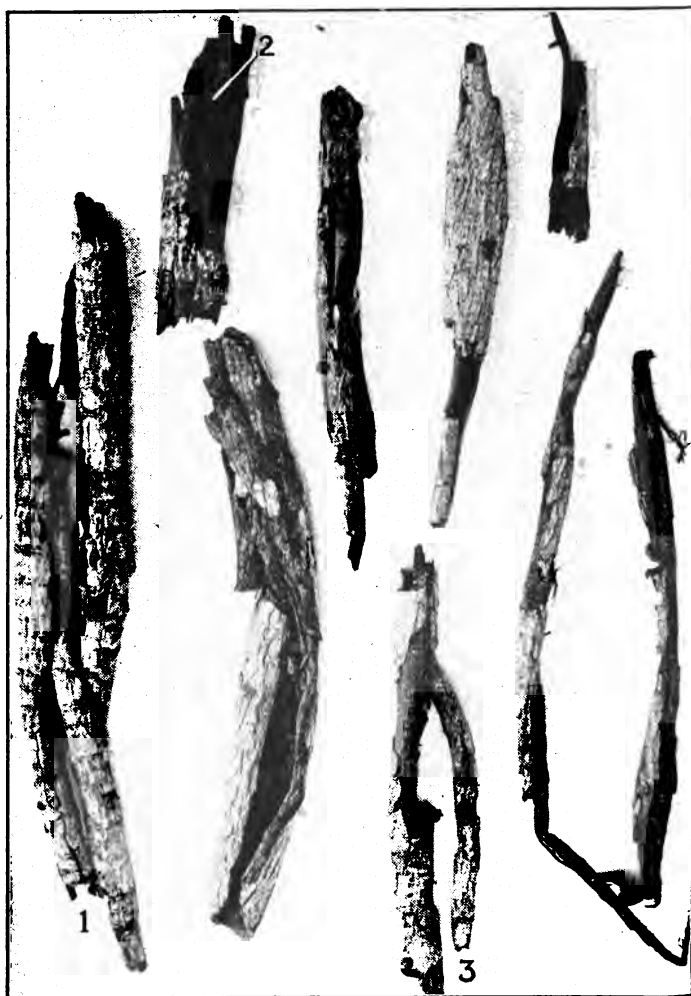
Constituents: Volatile oil, wax, acrid resin, coloring matter, bitter principle, etc.

Dose:

Preparations:

Fluidextractum Mezerei N. F. (Used externally.)

Fluidextractum Sarsaparillæ Compositum; Dose, 2 mls (30 min.).



CASCARILLA

1, Bark with the outer corky layer covered with lichens.
2, Piece of the bark with outer corky layer removed. 3,
Small pieces of the bark.

CASCARILLA (Cascarill.) N. F.

English name: Cascarilla.

Synonyms: Sweetwood Bark, Sweet Bark.

Botanical origin: *Croton Eluteria* (Linné) Bennett.
(Fam. *Euphorbiaceæ*.)

Part used: Bark.

Impurities: Not more than 5 per cent. of adhering wood.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Bahama Islands.

Description:

Cascarilla bark occurs as a mixture of broken and cut pieces. These pieces measure up to 7.5 dm. in length, in small pieces usually up to 1 cm. in width and to 2 mm. in thickness. The bark is partially quilled and quilled. The *outer surface* is light gray except where the outer bark has been removed; then it varies in color from reddish brown to greenish brown. The thicker gray pieces are transversely fissured and longitudinally wrinkled; where the outer bark is removed the surface is smooth or slightly wrinkled. The *inner surface* varies from yellow to greenish brown; it is finely striated longitudinally. The *fracture* is very weak and brittle; that of the thinner bark is incomplete. The *fractured surface* is greenish brown and slightly radiate. The *odor* is pleasingly aromatic. The *taste* is pungent and bitter.

Constituents: Volatile oil, resin, fat, pectin, tannin, cascarillin, etc.

Dose: 2 Gm. (30 grains).



QUILLAJA

1. Inner surface of the peeled bark. 2. Outer surface of the peeled bark with dark red patches of cork.

QUILLAJA N. F.

English name: Quillaja.

Synonyms: Soap-tree Bark.

Botanical origin: *Quillaja Saponaria* Molina. (Fam. Rosaceæ.)

Part used: Peeled bark.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Chile to Peru.

Description:

Quillaja occurs as a mixture of cut and broken pieces of the peeled bark. These pieces measure up to 7.8 dm. in length, to 2.7 dm. in width and to 10 mm. in thickness. The bark is flat or slab-like and partially quilled. The outer surface varies from yellowish gray to purplish brown when cork patches are present; it is frequently fissured. The inner surface is yellowish gray; it is non-striated, granular, and nearly smooth, and has small nodular projections and circular depressions. The fracture is incomplete and very strong, tough and hackly. The broken surface is coarsely fibrous and yellowish white. The odor is not characteristic. The taste is acrid.

Constituents: Glucosides (quillajic acid, quillajasapotoxin), tannin, calcium oxalate and sulphate, etc.

Dose: Not used internally.

Preparations:

Tinctura Quillajæ.



ULMUS

1, Outer surface of the peeled bark with adhering patches of cork. 2, Fibers showing at the broken ends. 3, The long, coarsely striated inner surface.

ULMUS U. S. P.

English name: Elm.

Synonym: Elm Bark, Slippery Elm.

Botanical origin: *Ulmus fulva* Michaux. (Fam. *Ulmaceæ*.)

Part used: Peeled bark.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Quebec to North Dakota, south to Florida and Texas.

Description:

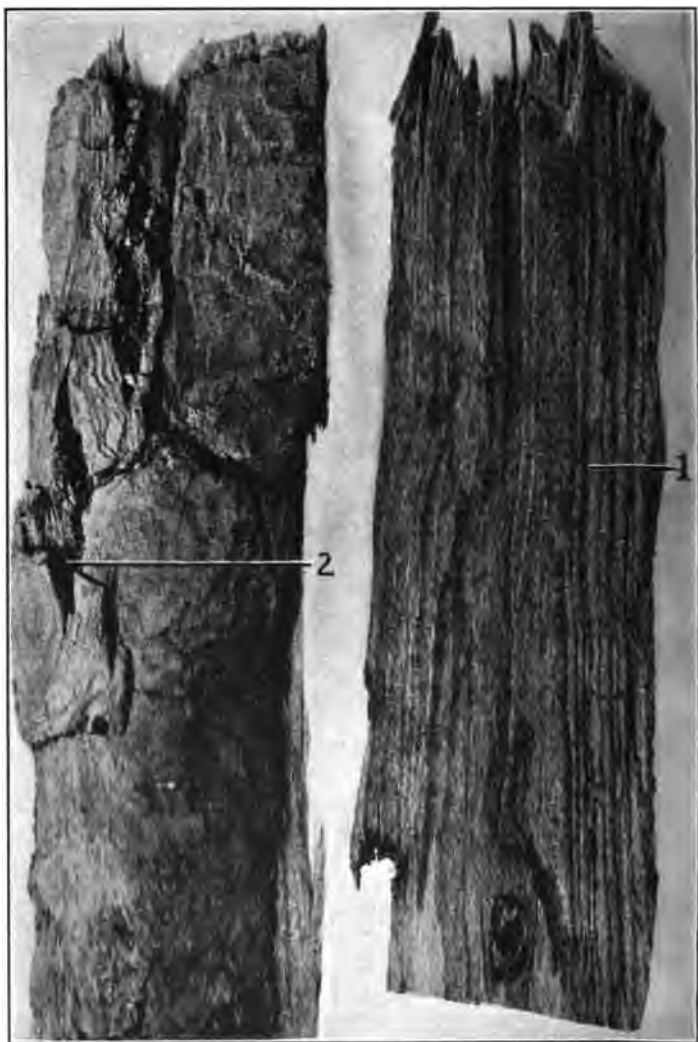
Elm bark occurs as a mixture of cut and broken pieces, or as cut and sawed pieces. These pieces measure up to 3 dm. in length, to 17 cm. in width and to 3 mm. in thickness. The sawed pieces are usually arranged in bundles, which measure up to 3 dm. in length, to 1.7 dm. in width and to 1.6 dm. in thickness. The bark is flat or slab-like and partially quilled. The outer surface varies in color from pinkish yellow to reddish brown, when cork patches are present; it has numerous partially detached bast fibers. The inner surface varies from brownish yellow to yellowish brown; it is coarsely striated longitudinally. The fracture is very strong, tough and incomplete. The fractured surface is very fibrous and of a light pinkish gray. The odor is distinct. The taste is sweet and mucilaginous.

Constituents: Gum, starch, tannin, etc.

Dose: None stated officially.

Preparations:

Trochisci Ulmi N. F.; Dose, 1 troche.



FRAXINUS

1, Coarsely striated inner surface. 2, Fissure of the partially peeled bark.

FRAXINUS (Fraxin.) N. F.

English name: White Ash Bark.

Synonyms: White Ash, Cane Ash.

Botanical origin: *Fraxinus americana* Linné, and probably other species of *Fraxinus*. (Fam. *Oleaceæ*.)

Part used: Peeled bark.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Nova Scotia to Minnesota, south to Florida and Texas.

Description:

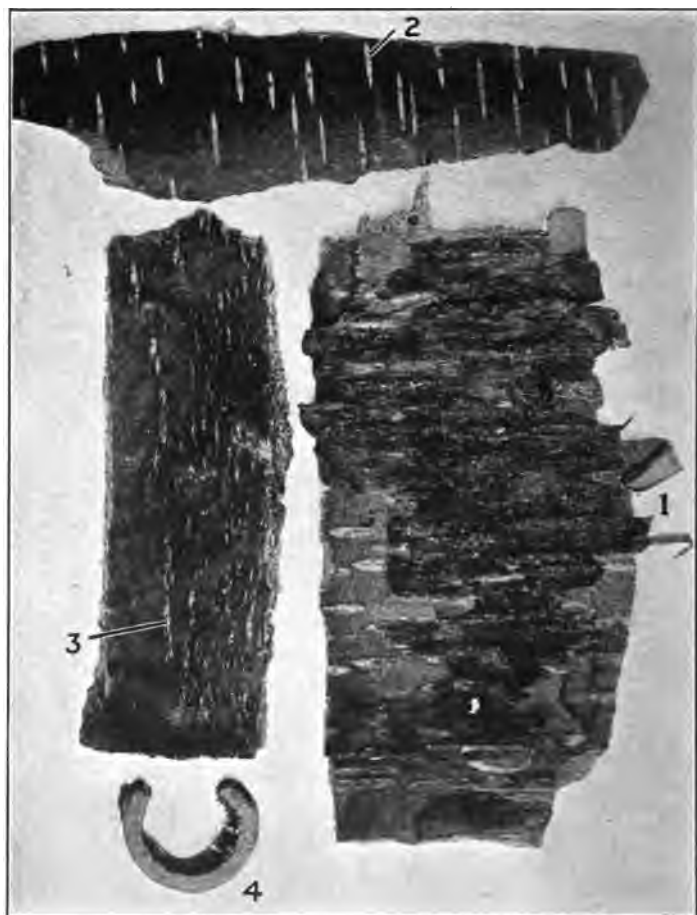
White ash bark occurs as a mixture of cut and broken pieces. These pieces measure up to 4 dm. in length, to 7 cm. in width and to 7 mm. in thickness. The bark is flat or slab-like and partially quilled. The outer surface varies in color from gray brown where it is fissured, to yellowish brown where the cork has been removed. The inner surface is brownish yellow, smooth where completely removed from the tree or striated longitudinally when partially removed. The fracture is very strong, tough, and incomplete. The fractured surface is coarsely fibrous. The odor is very slightly aromatic. The taste is slightly pungent, bitter and acrid.

Constituents: Fraxin (glucoside), a bitter substance (fraxetin), tannin, mannit, volatile oil, gum, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Vinum Fraxini; Dose, 4 mls (1 fl. dr.).



PRUNUS VIRGINIANA

1, Outer surface of the bark with adhering cork. 2, Peeled bark with numerous white lenticels. 3, Finely striated and fissured inner surface. 4, Cross-section of stem bark.

PRUNUS VIRGINIANA (Prun. Virg.) U. S. P.

English name: Wild Cherry.

Synonyms: Wild Cherry Bark, Black Cherry Bark.

Botanical origin: *Prunus serotina* Ehrhart (*Prunus virginiana* Miller). (Fam. *Rosaceæ*.)

Part used: Stem bark.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Ontario to North Dakota, south to Florida and Texas.

Description:

Wild Cherry occurs as a mixture of cut and broken pieces, which may be peeled, partially peeled and unpeeled. These pieces measure up to 30 cm. in length, to 5 cm. in width and to 4 mm. in thickness. The bark is chip-like or partially quilled. The *outer surface*, if unpeeled, is brownish black; it has numerous transversely elongated brown lenticels; if the outer surface is peeled it is brownish green and brown; it has numerous transversely elongated grayish white lenticel scars. The *inner surface* varies from yellowish brown to reddish brown; it is finely striated and fissured. The *fracture* is weak, brittle and uneven. The *fractured surface* is yellowish and reddish brown, granular and slightly fibrous. The *odor* is aromatic, bitter-almond-like when moistened. The *taste* is astringent and pungent.

Constituents: Amygdalin (glucoside), ferment (emulsin), bitter principle, resin, tannin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Pruni Virginianæ N. F.; Dose, 2 mls (30 min.)

Infusum Pruni Virginianæ N. F.; Dose, 60 mls (2 fl. ozs.).

Syrupus Pruni Virginianæ; Dose, 4 mls (1 fl. dr.).

Vinum Pruni Virginianæ N. F.; Dose, 4 mls (1 fl. dr.).



CASCARA SAGRADA

1, Hepatics attached to the outer surface. 2, Surface covered with lichens. 3, Fruiting lichens. 4, Cross-section of a double quill. 5, Cross-section of a partially quilled bark. 6, Overlapping quilled bark.

CASCARA SAGRADA (Casc. Sagr.) U. S. P.

English name: Cascara Sagrada.

Synonyms: Cascara Bark, Chittem Bark.

Botanical origin: *Rhamnus Purshiana* de Candolle.
(Fam. *Rhamnaceæ*.)

Part used: Bark of the trunk and branches.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Northwestern United States, south to Northern California and Idaho.

Description:

Cascara Sagrada occurs as cut pieces or entire and broken pieces. These pieces measure up to 6 dm. in length, to 8.5 cm. in width and to 6 mm. in thickness. The bark is chip-like, partially quilled, quilled, and overlapping quilled. The *outer surface* varies in color from purple to grayish purple to light gray. The *surface* of the thin bark has prominent transverse lenticels; the thicker bark, a few broad lenticels with apothecia; still thicker pieces have longitudinal fissures and attached moss or hepatic plants. The *inner surface* varies in color from yellowish to reddish to purplish brown; it is smooth and non-striated. The *fracture* is brittle and uneven. The *fractured surface* is brownish yellow, granular and fibrous. The *odor* is slight. The *taste* is slightly sweet and bitter.

Constituents: Resins, emodin, cascarin, frangulin, tannin, fixed and volatile oils, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Elixir *Cascaræ Sagradæ* N. F.; Dose, 4 mls (1 fl. dr.).

Elixir *Cascaræ Sagradæ Compositum* N. F.; Dose, 4 mls (1 fl. dr.).

Extractum *Cascaræ Sagradæ*; Dose, 0.25 Gm. (4 grains).

Fluidextractum *Cascaræ Sagradæ*; Dose, 1 mil (15 min.).

Fluidextractum *Cascaræ Sagradæ Aromaticum*; Dose, 2 mls (30 min.).

Fluidglyceratum *Cascaræ Sagradæ* N. F.; Dose, 1 mil (15 min.).

Fluidglyceratum *Cascaræ Sagradæ Aromaticum* N. F.; Dose, 1 mil (15 min.).



CINNAMOMUM SAIGONICUM

1, Bark from a small branch. 2, Outer surface of medium thick bark. 3, Inner surface of the bark. 4, Outer and inner surface of a thicker bark.

CINNAMOMUM SAIGONICUM (Cinnam. Saigon.)
U. S. P.

English name: Saigon Cinnamon.

Synonyms: Annam Cinnamon.

Botanical origin: An undetermined species of *Cinnamomum*. (Fam. *Lauraceæ*.)

Part used: Bark.

Impurities: None given in U. S. P.

Assay: Not less than 2 per cent. of volatile extractive, soluble in ether.

Ash: Not more than 6 per cent. The amount of ash insoluble in diluted hydrochloric acid does not exceed 2 per cent. of the weight of Saigon Cinnamon taken.

Habitat: China.

Description:

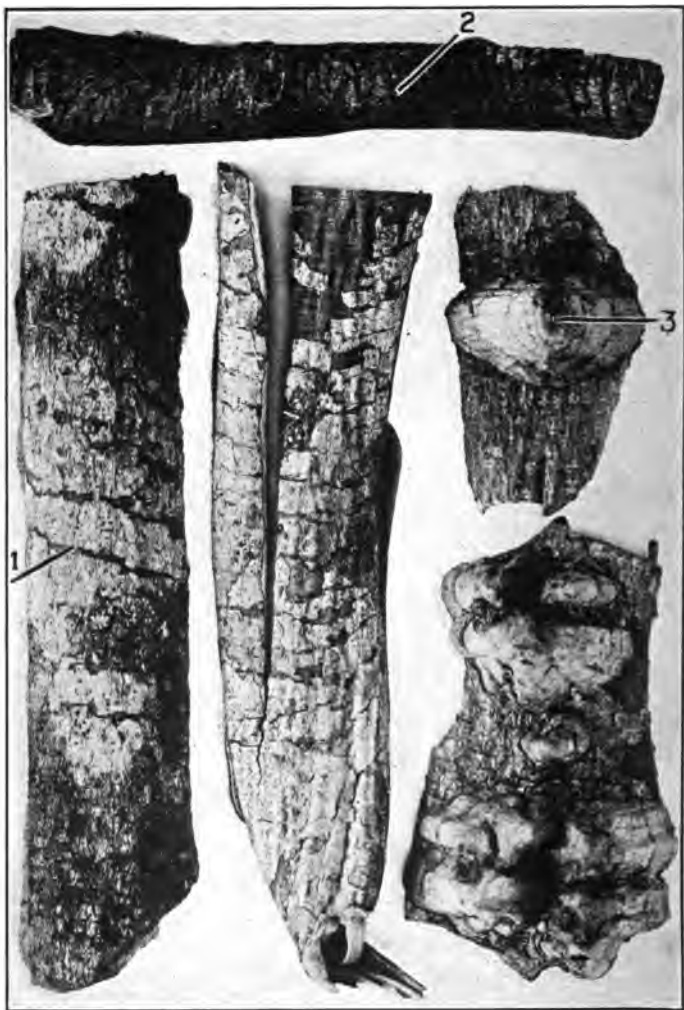
Saigon Cinnamon occurs as a mixture of long, cut and broken pieces. These pieces measure up to 2.9 dm. in length, to 3.8 mm. in width and to 5 mm. in thickness; they are usually arranged in bundles which measure up to 2.9 dm. in length and to 18 cm. in width. Each bundle is held together with three strands of bamboo, and a bamboo stick on which are Chinese characters occurs in each bundle. The bark is quilled and overlapping quilled. The outer surface of the thin bark is dark purplish brown; it is longitudinally striated and has portions of branches or branch scars; that of the thicker bark varies in color from brown to grayish brown; the surface is rough and wrinkled and has branch scars. The inner surface varies in color from light yellowish to reddish brown; it is very finely striated and granular. The fracture of the thin pieces is very weak and brittle; that of the thicker pieces, brittle. The fractured surface has a dark brown outer and inner layer and a light yellowish brown central layer. The thicker pieces are granular and have numerous masses of white bast fibers. The odor is aromatic. The taste is very sweet, aromatic and pungent.

Constituents: Volatile oil, mucilage, resin, sugar, tannin, cinnamic aldehyde, etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

Fluidextractum Aromaticum; Dose, 1 mil (15 min.).
Pulvis Aromaticus; Dose, 1 Gm. (15 grains).
Pulvis Cretæ Aromaticus N. F.; Dose, 2 Gm. (30 grains).
Syrupus Cinnamomi N. F.; Dose, 4 mls (1 fl. dr.).
Tinctura Aromatica N. F.; Dose, 2 mls (30 min.).
Tinctura Cinnamomi; Dose, 2 mls (30 min.).



XANTHOXYLUM—SOUTHERN PRICKLY ASH

1, Outer surface showing wide shallow fissures and gray lichens. 2, Peeled bark. 3, Corky wart surmounted by a spine, and just beneath is a piece of bark with a cluster of warts.

XANTHOXYLUM (Xanthox.) U. S. P.

(1) Southern Prickly Ash

English name: Xanthoxylum.

Synonyms: Southern Prickly-ash Bark, Pepper Wood.

Botanical origin: *Xanthoxylum Clava-Herculis* Linné.
(Fam. *Rutaceæ*.)

Part used: Bark.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Virginia to Arkansas, south to Florida and Texas.

Description:

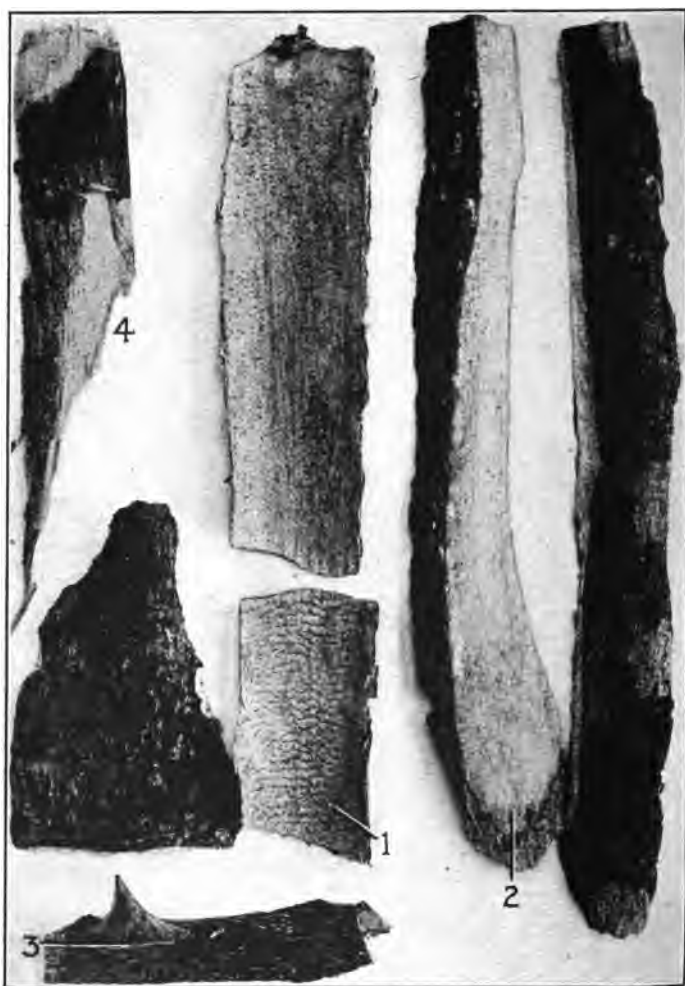
Southern Prickly-ash Bark occurs as a mixture of cut and broken pieces. These pieces measure up to 20 cm. in length, to 6 cm. in width and to 3 mm. in thickness. The bark is chip-like, or partially quilled and quilled. The outer surface is usually covered with gray lichens and shallow transverse fissures and yellow lenticels. The peeled outer bark is greenish or yellowish brown and smooth. Many of the pieces of the bark have solitary or clustered wart-like elevations of cork, frequently surmounted by a small spine. The inner surface varies in color from yellowish green to greenish brown, and it glistens with many small crystals. The fracture is brittle. The fractured surface varies in color from yellowish to dark brown; it is finely radiate and has numerous yellowish brown oil cavities and glistening crystals. The odor is not characteristic. The taste is bitter, acrid and pungent.

Constituents: Volatile oil, fat, sugar, tannin, acrid resin, alkaloid (xanthoxyline), etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Xanthoxyli; Dose, 2 mls (30 min.).



XANTHOXYLUM—NORTHERN PRICKLY ASH

1, Scaly inner surface of the bark. 2, Partially peeled bark. 3, Spine attached to the outer surface. 4, Bark showing a fragment of attached wood.

XANTHOXYLUM (Xanthox.) U. S. P.

(2) Northern Prickly Ash

English name: Xanthoxylum.

Synonyms: Northern Prickly-ash Bark, Toothache Tree.

Botanical origin: *Xanthoxylum americanum* Miller.
(Fam. *Rutaceæ*.)

Part used: Bark.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Quebec to Minnesota, south to Georgia and Nebraska.

Description:

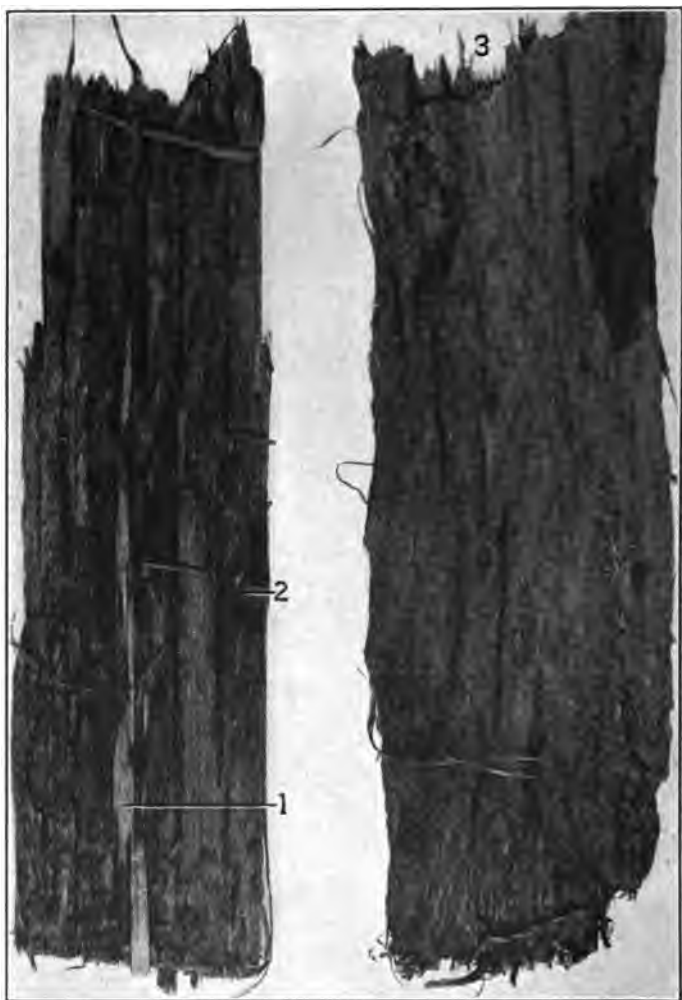
Northern prickly-ash bark occurs as a mixture of cut and broken pieces. These pieces measure up to 15.5 cm. in length, to 22 mm. in width and to 3 mm. in thickness. The bark is chip-like and partially quilled. The *outer surface* varies in color from gray to grayish black; it is slightly striated longitudinally and furrowed, and has an occasional bud stem scar and spines. The *inner surface* is gray and yellowish white; it is finely striated longitudinally, and it has great numbers of minute *oleoresin* cavities with resin. Occasionally the surface is scaly. The *fracture* is weak, brittle and uneven. The *fractured surface* is nearly black in the outermost layer, yellowish in the middle layer, and yellowish brown and radiate in the inner layer. The entire surface has minute *oleoresin* cavities. The *odor* is not characteristic. The *taste* is bitter, acrid and strongly pungent.

Constituents: Volatile oil, fat, sugar, tannin, acrid resin, alkaloid (xanthoxyline), etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Xanthoxyli; Dose, 2 mls (30 min.).



QUERCUS

1, Piece of wood attached to the inner surface. 2, Longitudinal striations. 3, Outer surface of the peeled bark showing the fibrous ends.

QUERCUS (Querc.) N. F.

English name: Quercus.

Synonyms: White Oak Bark.

Botanical origin: *Quercus alba* Linné. (Fam. *Fagaceæ*.)

Part used: Peeled bark of the trunk and branches.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Maine to Minnesota, south to Florida and Texas.

Description:

Quercus occurs as a mixture of cut and broken pieces. These pieces measure up to 4 dm. in length, to 7 cm. in width and to 8 mm. in thickness. The bark is flat, slab-like or partially gulled. The *outer surface* varies in color from light brown to dark brown; it is striated and has numerous partially detached groups of bast fibers. The *inner surface* is dark brown and striated longitudinally; the striated portion is often porous. The *fracture* is strong, tough and incomplete. The *fractured surface* is dark brown and coarsely fibrous. The *odor* is not characteristic. The *taste* is strongly astringent.

Constituents: Quercitannic and gallic acids, oak-red, pectin, resin, fat, bitter principle, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Quercus; Dose, 1 mil (15 min.).



PINUS ALBA

1, Corrugated inner surface of the bark. 2, Striated outer surface with numerous round oleoresin cavities with resins.

PINUS ALBA (Pinus Alb.) N. F.

English name: White Pine Bark.

Synonyms: Northern Pine, Spruce Pine.

Botanical origin: *Pinus Strobus* Linné. (Fam. *Pinnaceæ*.)

Part used: Peeled bark.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 3 per cent.

Habitat: Newfoundland to Manitoba, south to New Jersey and Iowa.

Description:

White Pine Bark occurs as a mixture of cut and broken pieces of the peeled bark. These pieces measure up to 8 dm. in length, to 4 dm. in width and to 3 mm. in thickness. The bark is flat and frequently folded several times lengthwise. The outer surface varies in color from pinkish yellow to brown; it is coarsely striated and has numerous oleoresin cavities with resin. The surface frequently has patches of brown or gray cork tissue. The inner surface is yellowish brown, finely striated, smooth, and corrugated. The fracture is strong, tough and incomplete. The fractured surface is light yellow and fibrous. The odor is not distinct. The taste is slightly sweet, bitter and astringent.

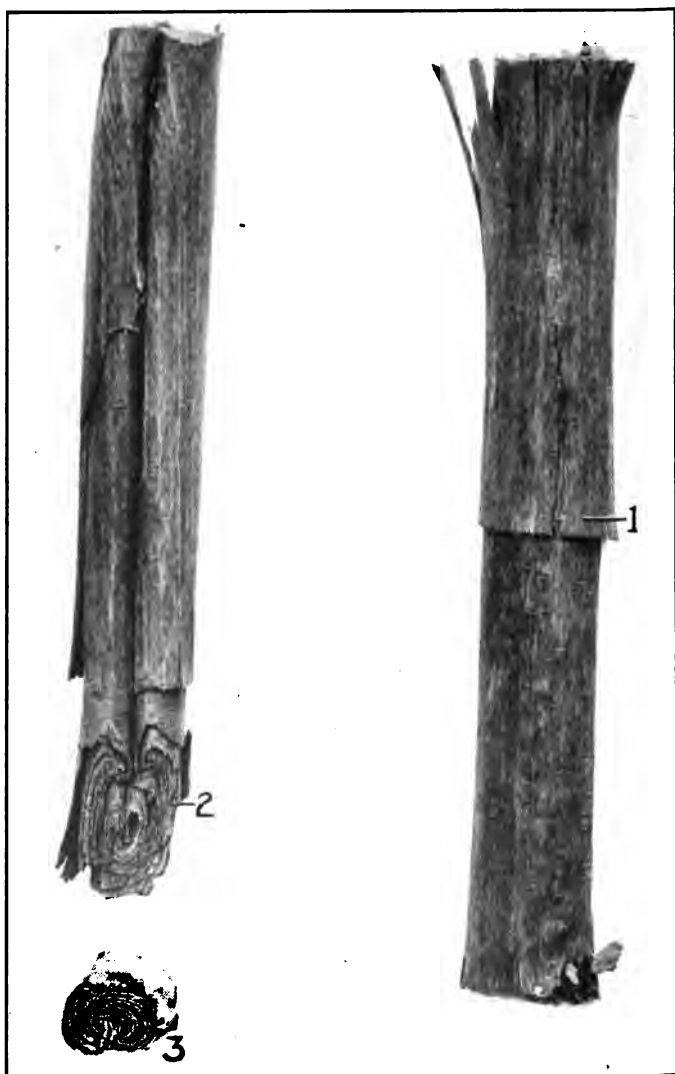
Constituents: Volatile oil, tannin, gum, resin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Syrupus Pini Strobi Compositus; Dose, 4 mls (1 fl. dr.).

Syrupus Pini Strobi Compositus cum Morphina; Dose, 2 mls (30 min.).



CINNAMOMUM ZEYLANICUM

1, Outer surface of a large quill. 2, Oblique section of a multiple overlapping quill. 3, Cross-section of a quill.

CINNAMOMUM ZEYLANICUM (Cinnam. Zeylan.)
U. S. P.

English name: Ceylon Cinnamon.

Synonyms: True Cinnamon.

Botanical origin: *Cinnamomum Zeylanicum* Breyne.
(Fam. *Lauraceæ*.)

Part used: Peeled bark.

Impurities: Not more than 3 per cent. of the outer bark or other foreign matter.

Assay: Not less than 0.5 per cent. of volatile extractive, soluble in ether.

Ash: Not more than 6 per cent. The amount of ash insoluble in hydrochloric acid does not exceed 2 per cent. of the weight of Ceylon Cinnamon taken.

Habitat: Island of Ceylon.

Description:

Ceylon Cinnamon occurs as cut, rarely as broken, pieces of the peeled bark. These pieces measure up to 1.2 m. in length, to 18 mm. in width, and to 1.5 mm. in thickness. The bark is multiple overlapping quilled; frequently there are fifteen individual pieces of bark in a quill. The *outer surface* is yellowish brown; it is striated and smooth and occasionally has branch scars. The *inner surface* is dark yellowish brown; it is finely striated and either smooth or rough. The *fracture* is very weak, brittle and uneven. The *fractured surface* is fibrous. The *odor* is aromatic. The *taste* is slightly sweet, pungent and slightly astringent.

Constituents: Volatile oil, mucilage, resin, sugar, tannin, cinnamic aldehyde, etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

None.



Ceylon Cinnamon, 40-inch quills, in bundle 18 inches in diameter, tied with 5 bands of rope and with an outer covering of burlap.

CHAPTER VI

WOODS AND PITH

IN the study of woods the following must be considered: Occurrence, size, nature, texture, color, surface, fracture, odor and taste.

1. **Occurrence.** Woods occur as cut, as sawed, or as bored pieces.

2. **Size.** The size of the pieces of the different woods is variable and not diagnostic.

3. **Nature.** Logwood is frequently in the form of logs; guaiac, in the form of borings; quassia, in the form of shavings or chips or cubes (sawed).

4. **Texture.** The texture of all the woods is fibrous; guaiac is resinous and fibrous.

5. **Color.** The woods vary greatly in color. The sap wood of quassia is gray; the heart wood, yellow; santalum album varies from yellow to reddish brown; santalum rubrum is brownish red.

6. **Surface.** The surface of all the woods is splintery.

7. **Fracture.** The fracture is in all cases hackly.

8. **Odor.** The only odorous wood is white sandalwood, which is aromatic; the other woods have no characteristic odor.

9. **Taste.** Quassia is strongly bitter; white sandalwood is pungent; guaiac wood is acrid and pungent; logwood is astringent.

PITH

Sassafras pith is the only one official. In studying piths one should keep in mind the characters given under *woods*.



QUASSIA

1, Cubes of the wood. 2, Chips. 3, Shavings.

QUASSIA (Quass.) U. S. P.

English name: Quassia.

Synonyms: Bitter Wood, Jamaica Quassia, Surinam Quassia.

Botanical origin: *Picrasma excelsa* (Swartz) Planchon or *Quassia amara* Linné. (Fam. *Simarubaceæ*.)

Part used: Wood.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: West Indies.

Description:

Quassia occurs as the sawed or cut pieces of the wood. These pieces are of variable size. The wood may be in the form of shavings, small chips, or sawed into cubes. The outer and inner surfaces of the sap-wood are gray; of the heart-wood light or dark yellow and slightly porous. The fracture of the larger pieces is very strong, tough and hackly. The fractured surface varies in color from gray to dark yellow; it is porous and fibrous. The odor is not characteristic. The taste is very strong and persistently bitter.

Constituents: Bitter principles, alkaloids, resin, pectin, mucilage, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Extractum Quassiae N. F.; Dose, 0.06 Gm. (1 grain).
Fluidextractum Quassiae N. F.; Dose, 0.5 ml (8 min.).
Tinctura Quassiae; Dose, 2 mls (30 min.).



SANTALUM ALBUM

1, Fragment of the wood showing the splintery ends. 2, Small fragment. 3, Fragment showing light patches of medullary rays.

SANTALUM ALBUM (Santal. Alb.) N. F.

(1) White Sandal Wood

English name: Sandal Wood.

Synonyms: White Sandal Wood, Yellow Sandal Wood.

Botanical origin: *Santalum album* Linné. (Fam. *Santalaceæ*.)

Part used: Heart-wood.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Southern India.

Description:

White Sandal Wood *occurs* as small logs or billets and as cut and broken pieces. The billets and pieces are of variable length and diameter. The *texture* is fibrous. The *color* varies from light yellowish to dark reddish brown. The *cut surface* has ax marks; it is smooth and dark yellowish brown. The *uncut surface* is rough and furrowed, or it has dark bands of medullary rays alternating with the lighter wood. The *fracture* of the smaller pieces is very strong, tough and hackly. The *fractured surface* is similar to the surface. The *odor* is pleasingly aromatic. The *taste* is slightly sweet and pungent.

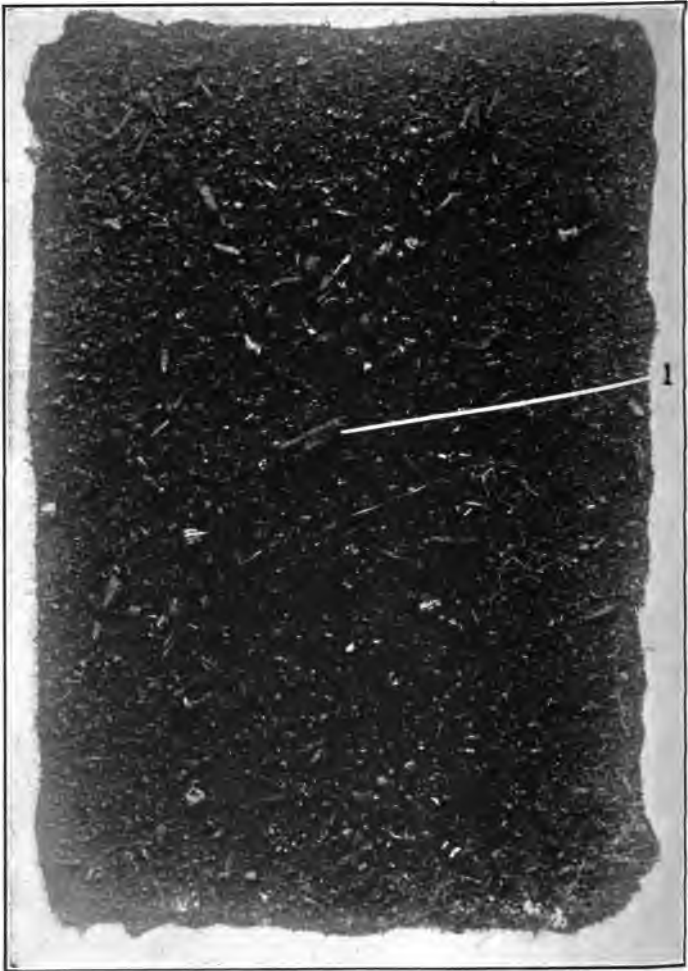
Constituents: Volatile oil, resin, tannin, etc.

Dose: Used only in the form of its preparations.

Preparations:

Oleum Santali U. S. P.; Dose, 0.5 mil (8 min.).

Tinctura Sabal et Santali N. F.; Dose, 4 mils (1 fl. dr.).



SANTALUM RUBRUM

1, A mass of granulated wood of variable size.

SANTALUM RUBRUM (Santal. Rub.) U. S. P.

(2) Red Sandal Wood

English name: Red Sandal Wood.

Synonyms: Red Saunders, Ruby Wood.

Botanical origin: *Pterocarpus santalinus* Linné filius.
(Fam. *Leguminosæ*.)

Part used: Heart-wood.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 3 per cent.

Habitat: East Indies.

Description:

Red Sandal Wood occurs usually as a mixture of fine and coarse powder. The largest pieces are usually less than a millimeter in length. The texture is fibrous. The color is bright brownish red. The surface is rough. The fracture and the fractured surface cannot be observed on account of the fineness of the powder. The odor is not distinct. The taste is slightly astringent.

Constituents: Red coloring matter, pterocarpin, resin, tannin, etc.

Dose: None given.

Preparations:

Enters into Tinctura Lavandulae Composita; Dose, 2 mls (80 min.).



GUAIACI LIGNUM

1, Mass of chips showing white nonofficial pieces. 2, Portion of a boring from a bowling ball. 3, Projecting fibers of the wood.

GUAIACI LIGNUM (Guaiac. Lig.) N. F.

English name: Guaiac Wood.

Synonyms: Lignum Vitæ, Lignum Sanctum.

Botanical origin: *Guaiacum officinale* Linné or *Guaiacum sanctum* Linné. (Fam. *Zygophyllaceæ*.)

Part used: Heart-wood.

Impurities: None given officially.

Assay: Yields not less than 15 per cent. extractive to alcohol.

Ash: Not more than 3 per cent.

Habitat: West Indies.

Description:

Guaiac wood *occurs* as a mixture of chips, shavings, cuttings and trimmings. Most of the drug is obtained as a by-product in the manufacture of bowling balls. The size of the pieces is very variable. The *texture* is fibrous. The *color* varies from greenish brown to reddish brown. The pieces of sap-wood are light yellow in color, and few of these should be present because they do not contain so much resin as the dark green heart-wood. The *surface* is powdery, rough and irregularly furrowed. The *fracture* of the smaller pieces is very strong, tough and hackly. The *fractured surface* is splintery. The *odor* is not characteristic. The *taste* is not distinct at first, but upon prolonged chewing it is acrid and pungent.

Constituents: Resin, cellulose, vasculose, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Guaiacum (Guaiac Resin), U. S. P.; Dose, 1 Gm. (15 grains).



HÆMATOXYLON

1, Pieces of worthless fermented wood. 2 and 3, Pieces of unfermented wood.

HÆMATOXYLON (Hæmatox.) N. F.

English name: Hematoxylon.

Synonyms: Logwood.

Botanical origin: *Hæmatoxylon campechianum* Linné.
(Fam. *Leguminosæ*.)

Part used: Unfermented heart-wood.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 3.5 per cent.

Habitat: Central America and West Indies.

Description:

Logwood occurs as small logs and as cut and broken pieces. The logs and pieces are of variable size. The texture is fibrous. The color of the outer surface is reddish brown, of the cut or broken surface yellowish red. It is longitudinally striated and slightly porous. The fracture of the smaller pieces is very strong, tough and hackly. The fractured surface is splintery and yellowish red. The fermented drug, which is frequently supplied as the official drug, is dark purplish brown and of an iridescent green color. The odor is not characteristic. The taste is slightly sweet and astringent.

Constituents: Volatile oil, tannin, resin, hematoxylin, etc.

Dose: None given.

Preparations:

Extractum Hæmatoxyli; Dose, 1 Gm. (15 grains).



SASSAFRAS MEDULLA

1. Straight piece of pith. 2. Mass of irregular pieces. 3. Curved pieces of pith.

SASSAFRAS MEDULLA (Sassaf. Med.) N. F.

English name: Sassafras Pith.

Synonyms: Ague-tree Pith.

Botanical origin: *Sassafras variifolium* (Salisbury)
O. Kuntz. (Fam. *Lauraceæ*.)

Part used: Dried pith.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Maine to Michigan, south to Florida and Texas.

Description:

Sassafras pith *occurs* as a mixture of broken and cut pieces. These pieces measure up to 15 cm. in length and to 6 mm. in diameter. The *texture* is non-fibrous and parenchymatic. The *color* varies from white to yellowish brown. The *surface* is striated and is split or cleft on the outer edge. The *fracture* is very weak and brittle, or it may be pliable. The *fractured surface* is yellowish white and porous. The *odor* is slight. The *taste* is mucilaginous.

Constituents: Gum, volatile oil, etc.

Preparations:

Mucilago Sassafras Medullæ; Dose, 15 mils (4 fl. drs.).

CARBO LIGNI (Carbo Lig.) U. S. P.

English name: Wood Charcoal.

Synonyms: Charcoal, Soft-wood Charcoal.

Botanical Origin: Variable.

Part used: Charred wood.

Impurities:

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Variable, according to the source of the wood.

Description:

Dull black, fine *powder*, which should not be gritty and which adheres to the fingers when touched; *odor* and *taste* not characteristic.

Dose: 1 Gm. (15 grains).

Preparations:

Trochisci Carbonis Ligni N. F.; Dose, 1 troche.

CHAPTER VII

STEMS

IN the study of stems the following must be considered: Occurrence, size, nature, nodes, internodes, texture, color, surface, fracture, outline, cortex, wood and pith.

1. **Occurrence.** Cactus and dulcamara occur as cut stems, arbor-vitæ as broken branches, scoparius as cut and broken branches.

2. **Size.** Cactus has a maximum diameter of 3 cm.; the smaller branches of scoparius are less than 1 mm. in diameter.

3. **Nature.** Cactus and dulcamara are simple (non-branched), scoparius and thuja are branched. In scoparius the branches are alternate.

4. **Nodes.** The nodes are usually enlarged and a variable distance apart. They are diagnostic.

5. **Internodes.** The internodes are very variable in length. In the older branches they are usually farther apart than in the younger branches.

6. **Texture.** The texture of cactus stem is succulent (non-fibrous), all the other stems are fibrous.

7. **Color.** The color of cactus is dark-green, of scoparius greenish brown; of thuja the color varies from dark green to reddish brown. Bittersweet is greenish brown.

8. **Surface.** The surface of cactus is spiny and channeled; of scoparius winged, of thuja covered with four rows of leaves; of bittersweet striated.

9. **Fracture.** The fracture of thuja, scoparius and bittersweet is uneven. Cactus grandiflorus bends, therefore it has no fracture.

10. **Outline.** The outline of *cactus grandiflorus* is wavy; of *scoparius* usually five-angled, of *thuja* irregular, of *bittersweet* cylindrical.

11, 12, 13. **Cortex, Wood and Pith.** The cortex of *cactus grandiflorus* is very thick and non-fibrous. The cortex in *thuja*, *scoparius* and *bittersweet* is thin and the wood is rather thick. In *bittersweet* the pith is hollow.



CACTUS GRANDIFLORUS

1, Central wood portion of a longitudinal section. 2, Thick mucilaginous cortex. 3, Ridges of a young stem. 4, Spines of the outer surface. 5, Circular wood portion. 6, Cross-section of a young stem.

CACTUS GRANDIFLORUS (Cact. Grand.) N. F.

English name: Cactus Grandiflorus.

Synonyms: Night-blooming Cereus, Sweet-scented Cactus.

Botanical origin: *Cactus grandiflorus* Linné [*Cereus grandiflorus* Miller]. (Fam. *Cactaceæ*.)

Part used: Fresh succulent stems.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: West Indies, Porto Rico and Mexico.

Description:

Cactus Grandiflorus occurs as long pieces several meters in length, or as pieces of variable length, contained in a bottle, etc., and covered with alcohol. The maximum diameter of the stem is 3 cm. The stems are simple or rarely branched (when cut). The *nodes* are not distinct. The texture of the cortex is mucilaginous; of the central cylinder fibrous. The *color* is dark green. The *surface* is deeply channeled longitudinally. The ridges have clusters of spines 6 mm. in length and occasionally tough branched roots. The *outline* is from 5 to 9 angled. The *cortex* is mucilaginous; the wood fibrous; the pith hollow. The *odor* is slightly aromatic. The *taste* is mucilaginous, sweet and bitter.

Constituents: Alkaloid (cactine), glucoside, resin, fat, etc.

Dose: None given.

Preparations:

Tinctura Cacti Grandiflori; Dose, 1 mil (15 min.).



SCOPARIUS

1, Stem showing the two wings ending in a node. 2, A large flower and a flower bud. 3, The hairy pistil. 4, Fruit. 5, Three foliate leaves.

SCOPARIUS (Scopar.) N. F.

English name: Scoparius.

Synonyms: Broom Tops.

Botanical origin: *Cytisus scoparius* (Linné) Link.
(Fam. *Leguminosæ*.)

Part used: Dried tops.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Asia and Europe.

Description:

Scoparius occurs as a mixture of cut and broken pieces of the tops. The pieces measure up to 9 dm. in length. The stems are branched and alternate. The branches curve upward parallel to the main stem. The nodes have small leaf scars and prominent buds. The internodes are of variable length and five-winged, the elevations beginning and ending in nodes. The texture is fibrous. The color of the small twigs is dark green, of the thicker twigs reddish brown. The surface is wrinkled or striated transversely. The fracture is tough. The outline is five-angled. The cortex is thin. The wood is yellowish. The pith is small. Occasionally a few leaves, flowers and fruits are present. The leaves are three-foliate. The petiole of the leaflets is long. The base is cuneate or acute. The margin is entire. The apex is mucronate. The outline is obovate or elliptical. The upper and under surface is ciliate. The odor is not distinct. The taste is disagreeably bitter.

Constituents: Sparteine (alkaloid), scoparin (glucoside), tannin, volatile oil, fat, sugar, coloring matter, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Scoparii; Dose, 1 mil (15 min.).



THUJA

1, A typical leafy twig. 2, Small twig showing three of the four rows of leaves. 3, Fruit attached to a young twig. 4, Seed.

THUJA (Thu.) N. F.

English name: Thuja.

Synonyms: Arbor Vitæ, White Cedar.

Botanical origin: *Thuja occidentalis* Linné. (Fam. Pinaceæ.)

Part used: Leafy young twigs.

Impurities: Not more than 1 per cent. of foreign substances.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: New Brunswick to Manitoba, south to North Carolina and Tennessee.

Description:

Thuja occurs as a mixture of broken pieces of leaves and twigs. The pieces measure up to 15 cm. in length. The leaves measure up to 5 mm. in diameter and to 4 mm. in width. The stems are branched. The nodes are not discernible. The leaves, which are arranged in four rows, are scale-like. The two lateral rows are keeled, and they partially overlap the two rows of flat leaves. All four rows are acute at the apex. The two rows of flat leaves have a large gland near the apex. The two rows of keel-shaped leaves have indistinct glands. The internodes are variable in length. The texture of the stem is fibrous. The color varies from dark green to yellowish brown. The fracture is fibrous. The outline of the twigs and leaves is irregular. The cortex is thin. The wood is finely fibrous. The odor is aromatic. The taste is terbinthinate (like turpentine) and bitter.

Constituents: Volatile oil, resins, wax, tannin, glucosides (pinipicrin, thujin), etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Thujæ; Dose, 2 mls (30 min.).



DULCAMARA

1, Mass of cut pieces. 2, Pith of the stem. 3, Thick wood.

DULCAMARA (Dulcam.) N. F.

English name: Bittersweet.

Synonyms: Woody Nightshade, Poison Berry, Wolf Grape.

Botanical origin: *Solanum Dulcamara* Linné. (Fam. *Solanaceæ*.)

Part used: Dried stems and branches.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Europe; naturalized in North America, New Brunswick to Minnesota, south to Georgia and Kansas.

Description:

Bittersweet occurs as a mixture of short, oblique and transverse sections. These pieces measure up to 1 cm. in length and to 7 mm. in diameter. The entire stems are branched. The nodes are slightly enlarged. The leaf buds are alternate. The internodes are not distinct. The texture is fibrous. The color varies from yellow to greenish brown. The surface is striated longitudinally. The fracture is brittle and uneven. The outline is cylindrical. The cortex is thin and dark greenish brown in color. The wood varies in color from gray to greenish brown. The pith is brown and hollow or solid. The odor is not distinct. The taste is bitter and sweet.

Constituents: Glucoside (dulcamarin), alkaloid (solanine), gum, wax, resin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Dulcamaræ; Dose, 4 mls (1 fl. dr.).



Euphorbia Pilulifera, 100 lbs. In mats, covered with light burlap.

CHAPTER VIII

PLANTS

IN the study of plants the following must be considered: (1) Leaves, (2) stems, (3) flowers, and (4) fruits.

LEAVES

In considering leaves, note carefully their occurrence; petiole, length, width, and nature; blade, base, margin, apex, outline, size, upper surface, under surface, texture, odor, and taste.

1. **Occurrence.** Leaves occur in a broken or entire condition.

PETIOLE

2. The petiole of euphorbia is very short; of coptis and drosera, very long.

BLADE

3. **Base.** The base of euphorbia and scutellaria is rounded; of the lobes of coptis, cuneate; of drosera, slenderly tapering.

4. **Margin.** The margin of the leaves of chirata and the droseras is entire. The margin of euphorbia is serrate. In coptis the margin is crenate.

5. **Apex.** The apex of drosera rotundifolia is rounded; of chirata, scutellaria, and euphorbia, acute.

6. **Outline.** The outline of drosera longifolia is oblong-spatulate; of drosera intermedia, spatulate; of drosera rotundifolia, orbicular; of chirata, oblong-spatulate; of scutellaria, ovate-lanceolate; of chirata, oblong-ovate.

7. **Size.** Varies greatly in the different leaves.

8. **Upper Surface.** A study of the upper surface includes the color, markings, and veins.

The color usually is dark green. The markings and the veins are not diagnostic.

9. **Under Surface.** The under surface is light gray and non-hairy except in euphorbia. The markings are not characteristic, and the veins are elevated prominently, as in scutellaria.

10. **Texture.** The texture is thin and papery, and the leaves are brittle.

11. **Odor.** The leaves of the plants have no characteristic odor.

12. **Taste.** The taste of chirata is very strongly bitter; of drosera, coptis, and euphorbia, less so; of scutellaria, only very slightly bitter. Euphorbia and the droseras also have a slightly acrid taste.

STEMS

In the study of stems the following must be considered: Occurrence, size, nature, nodes, internodes, texture, color, surface, fracture, outline, cortex, wood, and pith.

1. **Occurrence.** Most stems occur in a broken condition.

2. **Size.** The size of the different stems is extremely variable, but for each there is a rather uniform maximum diameter. The stems of plants vary in diameter from 1 mm., as in chirata, to 4 mm., as in scutellaria.

3. **Nature.** Stems are simple, as in cactus, or branched, as in scoparius.

4. **Nodes.** The nodes are enlarged in most of the plants studied. Euphorbia Pilulifera is an example. From the nodes may develop one branch, in which case they *alternate* on the stem, as in chirata; if they develop two stems at the node, the branches are then *opposite*, as in scutellaria.

5. **Internode.** This is variable and not diagnostic.

6. **Texture.** The stems of all the plants are fibrous. *Chirata* is quite woody; *scutellaria* is fibrous, but not woody. The sundews never have stems except when in flower.

7. **Color.** The color is purplish brown, as in *chirata*; yellowish brown, as in *scutellaria*; reddish brown, as in *euphorbia*.

8. **Surface.** The surface may be smooth, as in *drosera rotundifolia*; slightly winged, as in *chirata*; sunken, as in *scutellaria*; and spotted, as in a few of the stems of *euphorbia*.

9. **Fracture.** The fracture has little diagnostic importance in the study of stems of herbs.

10. **Outline.** The outline is quadrangular, as in *scutellaria* and in the small branches of *chirata*; or cylindrical, as in the larger *chirata* stems and in *euphorbia*.

11, 12, 13. The study of the **cortex, wood and pith** is not macroscopically diagnostic in the stems of the official plants.



CHIRATA

1, Root of the plant. 2, Flowering and fruiting top. 3, Fruit. 4, Leaf showing the characteristic venation.

CHIRATA (Chirat.) N. F.

English name: Chirata.

Synonyms: Chirayta, Chiretta, Bitter Stick.

Botanical origin: *Swertia Chirayita* (Roxburgh)
Hamilton. (Fam. *Gentianaceæ*.)

Part used: Dried plant.

Impurities: None given.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Northern India.

Description:

Chirata occurs as entire and as broken pieces of the plant. These pieces measure up to 10 dm. in length. The stems are usually branched. The nodes are enlarged. The leaves and branches are alternate. The internodes are of variable length. The texture is fibrous. The color varies from light yellow to purplish brown. The surface of the stem is smooth and slightly winged and striated. The fracture is fibrous. The outline of the thick stems is cylindrical, of the small stems four-sided. The cortex is thin. The wood is thin and brown. The pith is large, hollow or solid. A few roots, leaves and fruits are usually present. The roots are simple or branched, tapering and woody. The leaves are sessile. The base is rounded. The margin is entire. The apex is acute or acuminate. The outline is oblong-ovate. The size is variable. The larger leaves measure up to 9 cm. in length and to 3 cm. in width. The under surface shows five or six prominent veins. The fruit is a two-celled capsule; the carpels are acute and usually partially opened. The odor is not distinct. The taste is strongly bitter.

Constituents: Tannin, wax, bitter principles (ophelic acid and chiratin), etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Chiratæ; Dose, 1 mil (15 min.).



DROSERA—ROUND-LEAVED

1. The round glandular leaves of the plant. 2, Flower cluster. 3. Large flower cluster. 4, Glandular hairs projecting from the edge of the leaf.

DROSERA (Droser.) N. F.

(1) Round-leaved Drosera

English name: Drosera.

Synonyms: Round-leaved Sundew, Common Sundew.

Botanical origin: *Drosera rotundifolia* Linné. (Fam. *Droseraceæ*.)

Part used: Air-dried flowering plant.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 30 per cent.

Habitat: Northern North America, south to Florida and Alabama.

Description:

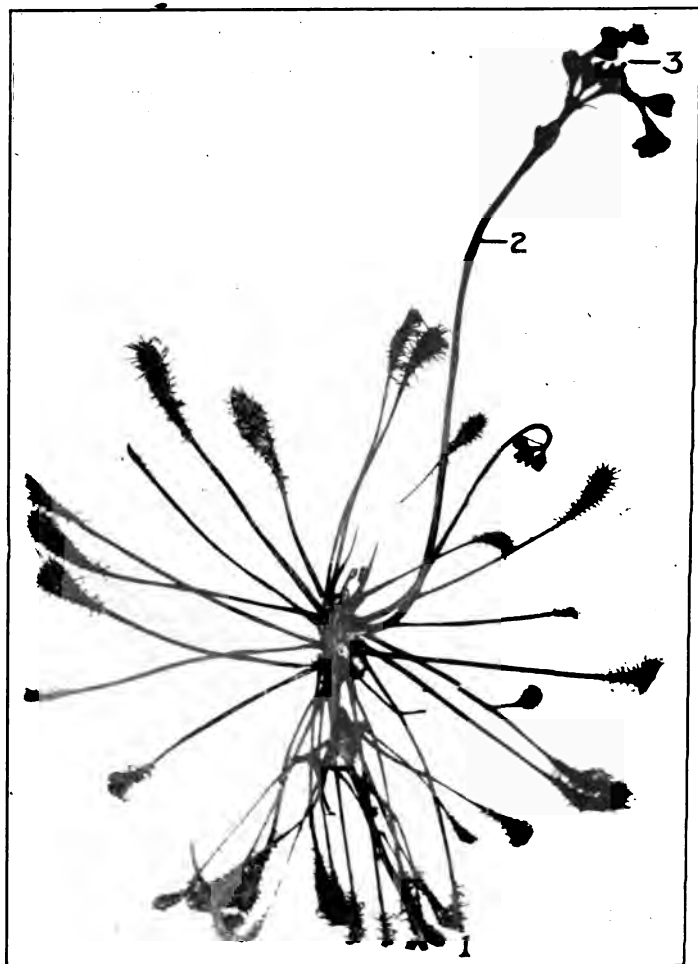
Round-leaved *Drosera* occurs as a mixture of entire and broken pieces of the plant. The plants measure up to 12 cm. when in flower. The leaves are all basal and are arranged in a rosette. The *petiole* is flat and pubescent and has glandular hairs which measure up to 5 mm. in length. The *base* of the blade is cuneate. The *margin* is entire. The *outline* is orbicular or broader than long. The *size* varies. The largest blades measure up to 1 cm. in width. The *upper surface* and *margins* have numerous glandular hairs. The *under surface* is nearly smooth. The *scape* is simple or branched and smooth. The *flowers* have five sepals, five petals, five stamens, and one pistil with a three-parted style. The *fruit* is a three-parted capsule containing many seeds. The *odor* of the plant is not distinct. The *taste* is slightly bitter and acrid.

Constituents: Resin, glucose, tannin, peptonizing ferment, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum *Droseræ*; Dose, 4 mls (1 fl. dr.).



DROSERA—INTERMEDIATE

1, Rosette of leaves. 2, Flower pedicle. 3, Cluster of flowers.

DROSERA (Droser.) N. F.

(2) Intermediate Drosera

English name: Drosera.

Synonyms: Intermediate Sundew.

Botanical origin: *Drosera intermedia* Hayne. (Fam. *Droseraceæ*.)

Part used: Plant.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 30 per cent.

Habitat: Northern North America, south to Florida and Louisiana.

Description:

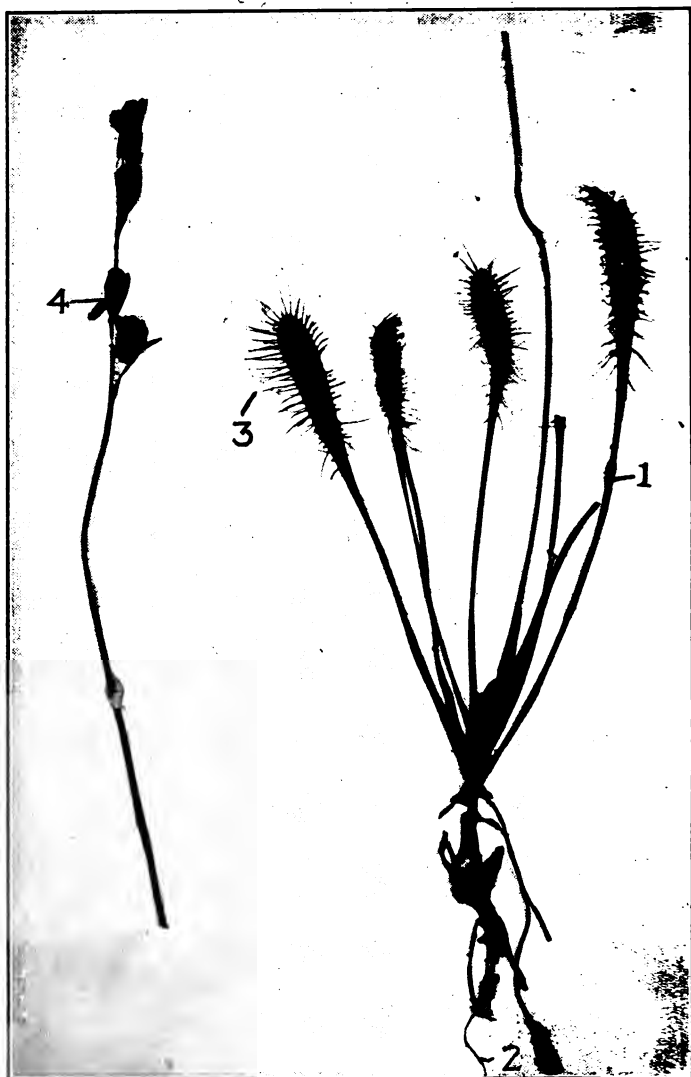
Intermediate *Drosera* occurs as a mixture of entire and broken pieces of the plant. The plants measure up to 11.5 cm. when in flower. The leaves are all basal and are arranged in an ascending rosette. The *petiole* is flat and glabrous; it measures up to 27 mm. in length. The *base* of the blade is acuminate. The *margin* is entire. The *outline* is spatulate. The *size* varies. The larger blade measures up to 13 mm. in length and to 4 mm. in diameter. The *upper surface* and *margins* have numerous glandular hairs. The *under surface* is smooth. The *scape* is simple or branched and smooth. The *flowers* have five sepals, five petals, five stamens, and one pistil with a three-parted style. The *fruit* is a three-parted capsule. The *odor* is not distinct. The *taste* is slightly bitter and acrid.

Constituents: Resin, glucose, tannin, peptonizing ferment, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum *Droseræ*; Dose, 4 mils (1 fl. dr.).



DROSERA—LONG-LEAVED

1, Spatulate leaves of the plant. 2, Roots of the plant.
3, Glandular hairs on the margin of the leaf. 4, Flower
cluster.

DROSERA (Droser.) N. F.

(3) Long-leaved Drosera

English name: Drosera.

Synonyms: Long-leaved Sundew.

Botanical origin: *Drosera longifolia* Linné. (Fam. *Droseraceæ*.)

Part used: Air-dried flowering plant.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 30 per cent.

Habitat: Europe and United States.

Description:

Long-leaved *Drosera* occurs as a mixture of entire and broken pieces of the plant. These plants measure up to 24 cm. when in flower. The leaves are all basal and erect. The *petiole*, which is flat and mostly glabrous, measures up to 4.7 cm. in length. The *base* of the *blade* is strongly tapering. The *margin* is entire. The *outline* is oblong spatulate. The size varies. The largest blades measure up to 2 cm. in length and to 4 mm. in width. The *upper surface* and margins have numerous glandular hairs. The *under surface* is smooth. The *scape* is usually simple and smooth. The flowers have five sepals, five petals, five stamens, and one pistil with a three-parted style. The *fruit* is a three-parted capsule. The seeds are numerous. The *odor* is not characteristic. The *taste* is bitter and acrid.

Constituents: Resin, glucose, tannin, peptonizing ferment, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum *Droseræ*; Dose, 4 mils (1 fl. dr.).



SCUTELLARIA

1, Petiole. 2, Acute apex. 3, Coarsely serrate margin.
4, Rounded base. 5, Single flower. 6, Leaf and axillary
raceme.

SCUTELLARIA (Scutell.) N. F.

English name: Scutellaria.

Synonyms: Skullcap, Hoodwort, Madweed.

Botanical origin: *Scutellaria lateriflora* Linné. (Fam. Labiatae.)

Part used: Dried plant.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Newfoundland to British Columbia, south to Florida and New Mexico.

Description:

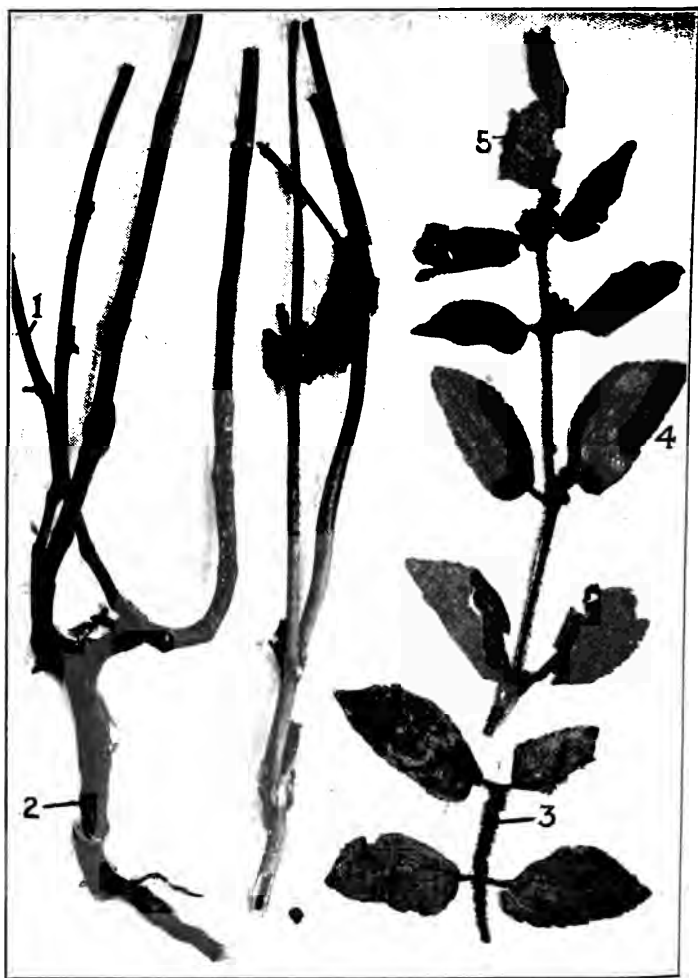
Scutellaria occurs as entire and as broken pieces of the herb. The stems measure up to 4 mm. in diameter. The stems are branched. The nodes are slightly enlarged. The leaves and stems are opposite. The internodes are of unequal length. The texture of the stem is fibrous. The color is yellowish green. The surface is smooth and sunken on four sides. The fracture is fibrous. The outline is square. The cortex and wood are thin. The pith is large. The leaves have petioles measuring up to 2.5 cm. The base of the blade is rounded or cordate. The margin is coarsely serrate. The apex is acuminate or acute. The outline is ovate lanceolate. The size is variable. Large leaves measure up to 7 cm. in length and 3 cm. in width. The upper surface is dark green. The under surface is light green. The veins are prominent on both surfaces. The flowers are in terminal or axillary racemes. The calyx is campanulate (two-lipped). The white or blue corolla turns yellow when dry; the two-lipped calyx enlarges at the throat. The calyx is helmet-shaped in the fruit, and contains the fruit. The odor of the plant is not distinct. The taste is slightly bitter.

Constituents: Scutellarin (glucoside), volatile oil, tannin, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Scutellariae; Dose, 1 ml (15 min.).



EUPHORBIA PILULIFERA

1, Stems of the plant. 2, Root of the plant. 3, Yellow hairs growing on the stem. 4, Leaf. 5, Flower cluster.

EUPHORBIA PILULIFERA (Euphorb. Pilul.) N. F.

English name: Euphorbia Pilulifera.

Synonyms: Pill-bearing Spurge, Asthma Weed.

Botanical origin: *Euphorbia pilulifera* Linné. (Fam. *Euphorbiaceæ*.)

Part used: Dried plant.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Florida to Texas, south to Tropical America.

Description:

Euphorbia pilulifera occurs as a mixture of the entire plant and broken pieces. The plant measures up to 25 cm. in length. The stems are simple or branched. The nodes are enlarged. The leaves and branches are alternate. The internodes are of variable length. The texture is fibrous. The color varies from grayish yellow to reddish brown. The surface is smooth, striated or spotted. The smaller stems are covered with a dense coat of long, yellow hairs; the thicker stems have scattered hairs. The fracture is brittle. The outline is cylindrical. The cortex, wood and pith are not distinctive. The leaves have short petioles. The blade is unequilateral and rounded at the base. The margin is finely serrate. The apex is acute. The outline is ovate lanceolate. The upper surface and the under surface are yellowish green and pubescent, and the veins are distinct. The flowers are inconspicuous and occur in axillary clusters. The fruits are very small and three-celled, and have as many as three seeds. The odor is not characteristic. The taste is bitter and acrid.

Constituents: Acrid and other resins. Not fully investigated.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Euphorbiæ Piluliferæ; Dose, 2 mls (30 min.).



COPTIS

1, Leaf with a long petiole. 2, Portion of a rhizome with slender roots. 3, Tangled mass of leaves, rhizomes and roots.

COPTIS (Cop.) N. F.

English name: Coptis.

Synonyms: Goldthread, Canker-root, Mouth-root.

Botanical origin: *Coptis trifolia* (Linné) Salisbury.
(Fam. *Ranunculaceæ*.)

Part used: Plant.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Northern North America, south to Canada and Minnesota.

Description:

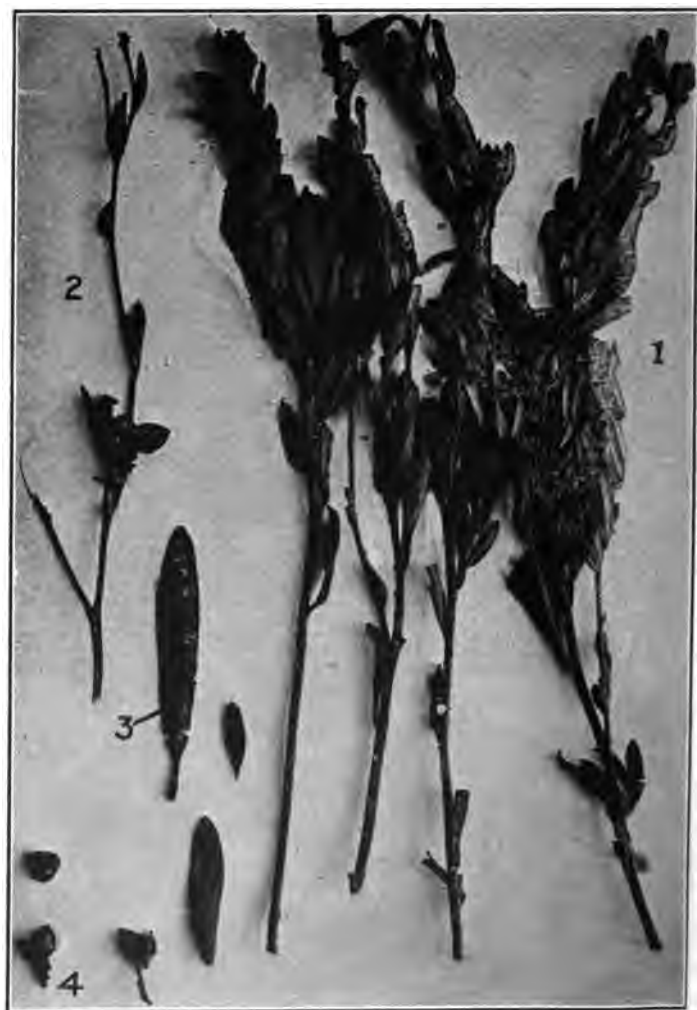
Coptis occurs as a mixture of entire and broken pieces of the plant. The rhizomes measure up to 20 cm. in length and to 1 mm. in diameter. The leaves measure up to 10 cm. in length. The rhizome is horizontal and branched. Minute stem scars and a circle of root occur at the node. The internodes are long. The texture is fibrous. The color varies from light to dark orange. The surface is smooth. The fracture is very weak and brittle. The outline is cylindrical. The cortex and the wood are bright orange. The leaves are trifoliate and have long petioles up to 9 cm. The base of the segments is cuneate. The margin of the wedge-shaped portion is serrate, of the remaining portion crenate mucronate. The apex of the side segments is two-lobed, of the central segment three-lobed. The upper surface is dark green and shiny above; the under surface is light green and dull. The odor of the plant is not distinct. The taste is bitter.

Constituents: Alkaloids (berberine, coptine), etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Coptis; Dose, 2 mls (80 min.).



HELIANTHEMUM

1, Stems, leaves and flowers. 2, Flower. 3, Leaf. 4, Fruit.

HELIANTHEMUM (Helianth.) N. F.

English name: Helianthemum.

Synonyms: Frost-weed, Rock-rose.

Botanical origin: *Helianthemum canadense* (Linné)
Michaux. (Fam. *Cistaceæ*.)

Part used: Herb.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Maine to Ontario, south to North Carolina
and Kentucky.

Description:

Helianthemum occurs as a mixture of entire or broken stems with leaves attached or separated. The plant measures up to 20 cm. in length. The stems are branched. The *nodes* are distinct. The leaves, stems and buds are alternate. The *internodes* are of variable length. The *texture* is woody. The *color* varies from gray to grayish red. The *surface* is canescent. The *fracture* is brittle. The *outline* is cylindrical. The *cortex* is thin. The *wood* is thick. The *pith* is small and hollow. The *petiole* of the leaf is short; the longest measures up to 5 mm. The *blade* is tapering at the *base*. The *margin* is entire and slightly revolute. The *apex* is acute or rounded. The *upper surface* varies in color from green to yellowish green and is canescent. The *under surface* is grayish green and canescent. The *flowers* are solitary or clustered. The solitary flowers have a *calyx* of five sepals, a *corolla* of five yellow petals, an *androeium* of thirty stamens, a *gynaeium* of one pistil with a 3-celled ovary, one style and a capitate stigma. The clustered flowers have a *calyx* of five sepals, no *corolla* (apetalous), an *androeium* of four stamens, a *gynaeium* of one pistil with a 3-celled ovary, one style, and a clavate stigma. The *fruit* is a three-celled capsule with numerous reticulate seeds. The *odor* is slight. The *taste* is bitter.

Constituents: Fixed and volatile oils, wax, tannin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Helianthemii; Dose, 4 mls (1 fl. dr.).



CENTAURIUM

1, Plants with flower clusters. 2, Separate flower cluster.
3, Two flowers. 4, Opposite leaves.

CENTAURIUM (Centaur.) N. F.

English name: Centaury.

Synonyms: European Century Herb, Lesser Centaury.

Botanical origin: *Erythræa Centaurium* (Linné) Persoon. (Fam. *Gentianaceæ*.)

Part used: Dried flowering plant.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Europe.

Description:

Centaury occurs as small bundles of the entire herb, held together with a strand of grass. The largest herbs measure up to 2 cm. in length, the stems to 2 mm. in diameter. The nodes are distinct. The leaves and stems are opposite. The internodes are of variable length. The texture is fibrous. The color is light green. The surface is finely striated and winged. The fracture is fibrous. The outline is angled. The cortex and wood are thin. The pith is hollow. The leaves, which have no petioles, are sessile. The blade is tapering at the base. The margin is entire. The apex is acute. The outline varies from oval to lance-linear. The largest leaves measure up to 23 mm. in length and to 8 mm. in width. The upper surface is dark green. The under surface is light green and is usually three-nerved. The flowers occur in compound racemes. The individual flowers have short pedicels, a calyx of five-parted lobes, a corolla united below and expanded above into five lobes, an andræcium of five stamens, a gynæcium of two carpels. The fruit is a two-celled capsule. The odor is not characteristic. The taste is strongly bitter.

Constituents: Bitter glucoside, volatile oil, resin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Tinctura Amara; Dose, 2 mls (30 min.).



Alexandria Senna, whole leaf, 250 to 500 lbs. Wooden case covered with heavy burlap.

CHAPTER IX

HERBS

IN the study of herbs the following must be considered: Leaves, stems, flowers, and sometimes the fruits.

LEAVES

In the study of the leaves of herbs the following must be considered: (1) Occurrence; (2) petiole, length, width, and nature; (3) blade, base, margin, apex, outline, size, upper surface, under surface, texture, odor, and taste.

1. **Occurrence.** The leaves occur in the broken or entire condition.

2. **Petiole.** The petioles vary greatly. In *passiflora* they are short, in *senecio* they are long, etc.

3. **Blade.** (a) The *base* of *passiflora* is rounded; of *helianthemum*, tapering; of *senecio*, cordate. (b) The *margin* in *centaurium* and in *helianthemum* is entire; in *verbena* it is doubly serrate; and in *senecio* it is lobed. *Adonis* and *pulsatilla* have compound leaves. (c) The *apex* of *senecio* is rounded; of *centaurium* and *helianthemum*, acute; of *verbena*, acuminate. (d) The outline of the divisions of *adonis* leaves is capillary; of *centaurium*, lanceo-linear; *verbena* is oblong-lanceolate; that of many of the radicle leaves of *senecio* are orbicular. (e) The *upper surface* embraces a study of the color, markings, and veins. The color varies from dark green, as in *centaurium*, to purplish green, as in *verbena* and *senecio*, to yellowish green, as in *passiflora*. No special markings occur on the leaves of the herbs. The veins are usually even with the surface. (f) The *under surface* varies in color from grayish green, as in *verbena*, to gray, as in

senecio. The markings are not diagnostic. The veins are elevated and usually characteristically arranged. In centaurium the three veins are very prominent. (g) The *texture* of all the leaves is papery, and they are very brittle. (h) The *odor* is so slight in the leaves of the herbs as to be uncharacteristic. (i) The *taste* in all cases is bitter. In adonis there is also a slight acrid taste.

STEMS

In the study of the stems of herbs the following must be considered: Occurrence, size, nature, nodes, internodes, texture, color, surface, fracture, outline, cortex, wood, and pith.

1. **Occurrence.** Stems occur in the broken, cut, or entire condition.

2. **Size.** The size of the stems of herbs varies from 2 mm., as in centaurium, to 7 cm., as in verbena.

3. **Nature.** The stems of herbs may be simple, as in pulsatilla, or branched, as in centaurium.

4. **Nodes.** The nodes are usually enlarged and the branches may be alternate, one at a node, as in passiflora; or opposite, two at a node, as in centaurium.

5. **Internodes.** A study of the internodes is not diagnostic.

6. **Texture.** The texture of the stems of all the herbs is fibrous but not woody.

7. **Color.** The stem of centaurium is light green; of helianthemum, grayish red; of verbena, purplish brown; of senecio, grayish purple; of passiflora, grayish or yellowish green; of adonis and pulsatilla, purplish.

8. **Surface.** The surface of helianthemum is canescent (hairy); of centaurium, winged; of verbena, channeled; of passiflora, striated; of adonis, sunken.

9. **Fracture.** The fracture is usually uneven and of slight importance.

10. Outline. The outline of verbenae is quadrangular; of passiflora, cylindrical; of senecio, adonis, and pulsatilla, irregular.

11, 12, and 13. The study of the cortex, wood and pith is not important in the study of the stems of the official herbs.



VERBENA

1, Mass of the cut herb. 2, Panicle spike of flowers. 3, Doubly serrate margin.

VERBENA (Verben.) N. F.

English name: Verbena.

Synonyms: Blue Vervain.

Botanical origin: *Verbena hastata* Linné. (Fam. *Verbenaceæ*.)

Part used: Herb (overground portion).

Impurities: None given officially.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Nova Scotia to British Columbia, south to Florida and New Mexico.

Description:

Verbena occurs as a mixture of broken and cut pieces of the herb. These pieces are of variable length and up to 7 cm. in diameter. The uncut stem is branched. The *nodes* are enlarged. The leaves and branches are opposite. The *internodes* are variable in length. The *texture* is fibrous. The *color* varies from green to purple. The *surface* is usually channeled on its four sides. The *fracture* is fibrous. The *outline* is quadrangular. The *cortex* is thicker at the angles. The *wood* is white. The *pith* is large, hollow and cylindrical. The *petiole* of the leaf measures up to 2 cm. The *blade* is rounded at the base. The *margin* is coarsely and doubly serrate; the inner teeth are smaller than the outer. The *apex* is acuminate or acute. The *outline* is mostly oblong-lanceolate. The *upper surface* is green or purplish green. The *under surface* is grayish green and the veins are prominent. The *flowers* occur in panicle spikes. Each flower is subtended by a subulate bract. The *calyx* is five-lobed. The *corolla* is usually blue or pink and five-lobed. The *andracium* consists of four stamens. The *gynaecium* consists of one pistil with a four-celled ovary, one style, and two stigmas, but only one lobe is stigmatic. The *fruit*, consisting of four nutlets, is enclosed in the calyx. The *odor* of the plant is not characteristic. The *taste* is bitter.

Constituents: Tannin and bitter principle. Not fully investigated.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Verbenæ; Dose, 1 mil (15 min.).



SENECIO

1, Leaf showing doubly dentate margin. 2, Small leaf.
 3, Lyrate pinnatifid leaf of the stem. 4, Flower. 5.
 Involucre bracts and receptacle. 6, Stem.

SENECIO (Sene.) N. F.

English name: Senecio.

Synonyms: Life-root, Golden Ragroot.

Botanical origin: *Senecio aureus* Linné. (Fam. *Compositæ*.)

Part used: Dried overground portion.

Impurities: None given.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Newfoundland to Ontario, south to Florida and Texas.

Description:

Senecio occurs as a mixture of the entire and broken pieces of the herb. The stems are branched. The nodes are distinct. The leaves and stems are alternate. The internodes are of variable length. The texture is fibrous. The color varies from yellow to grayish purple. The fracture is brittle. The outline is irregular. The cortex and wood are thin. The pith is hollow. There are two types of leaves, radical and stem. The radical leaves have petioles measuring up to 28 cm. The base is usually cordate. The margin is sharply and often doubly dentate. The apex is rounded. The outline is ovate or nearly orbicular. The upper surface varies from green to purplish green. The under surface is grayish, brownish, or purplish green, and the veins are prominent. The stem leaves are subtended by bracts, and they are sessile, lyrate pinnatifid. The flowers occur as heads arranged in corymbs. The peduncle is long. The involucre consists of two rows of bracts, the outer smaller, the inner larger and linear. The ray flowers are yellow and number up to twelve. The disk flowers are numerous and perfect. The receptacle is convex and non-scaly. The fruits are achenes, each of which has a white pappus. The odor is not distinct. The taste is bitter and slightly pungent.

Constituents: Acrid bitter principle and tannin. Not fully investigated.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Senecionis; Dose, 4 mls (1 fl. dr.).



PASSIFLORA

1, Three-lobed leaf. 2, Coiled tendril. 3, Stem. 4, Fruit.
 5, Developing fruit. 6, Crown. 7, Flower.

PASSIFLORA (Passiflor.) N. F.

English name: Passion Flower.

Synonyms: Passion Vine.

Botanical origin: *Passiflora incarnata* Linné. (Fam. *Passifloraceæ.*)

Part used: Herbage collected after some of the berries have matured.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Virginia to Missouri, south to Florida and Texas.

Description:

Passion Flower Herb occurs as broken pieces. These pieces are of variable length. The stems are branched. The nodes are distinct. The leaves and stems or scars are alternate. The internodes are of variable length. The texture is fibrous. The color is grayish green. The surface is striated. The fracture is brittle. The outline is cylindrical. The cortex and wood are thin. The pith is hollow or solid. The leaves vary from three to five-lobed. The petioles measure up to 1 cm. At the point of union with the blade there are two glands. The blade is round or subcordate at the base and the margin is finely serrate. The apex of the lobes is acute. The outline is orbicular if the lobes are connected. The size is variable. The length is up to 12 cm., the width to 12 cm. The upper surface is dark green. The under surface is yellowish green and the veins are prominent. The pedicel of the flower is three-bracted. The flower has a calyx of five imbricated, cuspidate sepals, a corolla of five yellow petals, a purple crown, an andræcium of five stamens with versatile anthers, and a gynæcium of one pistil with a three-parted style terminating in three club-shaped stigmas. The fruit is an indehiscent berry with numerous seeds. The odor is not distinct. The taste is slightly bitter.

Constituents: Alkaloid (trace). Not fully investigated.

Dose: 0.2 Gm. (3 grains).

Preparations:

Tinctura Passifloræ; Dose, 0.6 mil (10 min.).



ADONIS

1, Stem. 2, Stem covered with leaves. 3, Flowers. 5, Fruit.

ADONIS (Adonis) N. F.

English name: Adonis.

Synonyms: Pheasant's Eye, False Hellebore.

Botanical origin: *Adonis vernalis* Linné. (Fam. *Ranunculaceæ*.)

Part used: Dried overground portion, Herb.

Impurities: Not more than 5 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Asia and Northern Europe.

Description:

Adonis occurs as a mixture of entire and broken pieces of the plant. The longest plants measure up to 25 cm. in length. They are simple or branched. The *nodes* are distinct. The *internodes* are variable in length. The *texture* is fibrous. The *color* varies from green to purplish green. The *surface* is striated longitudinally and sunken. The *base* is surrounded by numerous scales. The *fracture* is fibrous. The *outline* is irregular. The *cortex* and *wood* are thin, collapsed on the hollow pith. The *leaves* are compound. The *petiole* is short. The *blade* is pinnatifid; the ultimate segments capillary. The *flowers* are solitary and terminal. It has a *calyx* of five greenish gray sepals, a *corolla* of five to twenty yellowish petals, an *androeium* of an indefinite number of stamens, and a *gynaeium* of an indefinite number of pistils. The *fruit* is capitate and consists of a great number of achenes. The *odor* is not distinct. The *taste* is bitter and acrid.

Constituents: Adonidin (glucoside), etc.

Dose: 0.125 Gm. (2 grains).

Preparations:

Fluidextractum Adonidis; Dose, 0.125 mil (2 min.).



PULSATILLA—ANEMONE

1, Many plumose achenes. 2, Small leaves. 3, Flower.
4, Radical leaves.

、PULSATILLA (Pulsatill.) N. F.

(1) *Anemone Pulsatilla*

English name: Pulsatilla.

Synonyms: Pasque Flower, Wind Flower.

Botanical origin: *Anemone Pulsatilla* Linné. (Fam. *Ranunculaceæ*.)

Part used: Dried herb.

Impurities: Not more than 5 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Europe and Northern Asia.

Description:

Anemone Pulsatilla occurs as entire or broken pieces of the herb. The stems are present when the plant is in flower or fruit. They are simple. The texture is herbaceous. The color is grayish green. The surface is striated and hairy. The fracture is uneven. The outline is irregular. The cortex and wood are not distinct. The pith is white. The leaves, which are longer than broad, are all radical. The petioles are of variable length. The blade is twice pinnately compound and the divisions are narrowly linear (narrowest of the official varieties). The flowers are solitary, terminal and erect. The six sepals are twice the length of the stamens. The andræcium consists of numerous stamens; the gynæcium, of numerous plumose pistils which are longer than the stamens. The fruit is an achene with a persistent plumose style. The odor is not distinct. The taste is slightly acrid.

Constituents: Tannin, volatile oil, bitter principle, anemonin (*pulsatilla camphor*), etc.

Dose: 0.3 Gm. (5 grains).

Preparations:

Tinctura Pulsatillæ; Dose, 2 mls (30 min.).



PULSATILLA—EUROPEAN

1, Plumose achenes. 2, Small leaves. 3, Flower. 4, Cut stem. 5, Circle of radical leaves.

PULSATILLA (Pulsatil.) N. F.

(2) European Pulsatilla

English name: Pulsatilla.

Synonyms: European Pulsatilla, European Pasque Flower.

Botanical origin: *Anemone pratensis* Linné. (Fam. *Ranunculaceæ*.)

Part used: Dried herb.

Impurities: Not more than 5 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Europe and Northern Asia.

Description:

European Pulsatilla occurs as entire or broken pieces of the herb. The stem (flower stalk) is present only in fruiting and flowering specimens. These stems are simple and below the flower there are three palmately divided hairy bracts. The texture is herbaceous. The color is grayish purple. The surface is finely striated and hairy. The fracture is uneven. The outline is irregular. The cortex and wood are thin. The pith is small. The leaves are longer than broad. The petioles are usually purple and they are hairy and of variable length. The blade is twice pinnately compound. The divisions are linear (broader than in *A. Pulsatilla* but narrower than in *A. Ludoviciana*). The flowers are terminal, solitary, nodding, bell-shaped and dark violet. The six sepals are turned back at the tip and their length is not twice that of the stamens. The andræcium consists of numerous stamens. The gynæcium of numerous plumose pistils. The fruit is an achene with a persistent plumose style. The odor is not distinct. The taste is slightly acrid.

Constituents: Tannin, volatile oil, bitter principle, anemonin (pulsatilla camphor), etc.

Dose: 0.3 Gm. (5 grains).

Preparations:

Tinctura Pulsatillæ; Dose, 2 mls (30 min.).



PULSATILLA—AMERICAN

1, Plumose achenes. 2, Closed flower. 3, Open flower.

PULSATILLA (Pulsatil.) N. F.

(3) American Pulsatilla

English name: Pulsatilla.

Synonyms: American Pulsatilla, Prairie Anemone.

Botanical origin: *Anemone Ludoviciana* (Nuttall) Heller. (Fam. *Ranunculaceæ*.)

Part used: Herb.

Impurities: Not more than 5 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: British Columbia, Nebraska south to Texas.

Description:

American Pulsatilla occurs as entire or broken pieces of the herb. The stems are present only when the plant is in flower or fruit. The stems are simple and just below the flower stalks there are three palmately divided hairy bracts. These bracts are best seen in the fruiting specimen. The texture is herbaceous. The color is grayish or purplish green. The surface is finely striated and hairy. The fracture is uneven. The outline is irregular. The cortex and wood are thin. The pith is large and frequently hollow. The leaves are broader than long and all are radical. The petioles are usually purple and they measure 35 cm. or less in length. The blade is palmate—pinnately compound; the divisions measure 6 mm. or less in width (broadest of the official varieties). The flowers are solitary, terminal and erect. The five-seven purple sepals are twice as long as the stamens. The andræcium consists of numerous stamens. The gynæcium consists of numerous plumose pistils. The fruit is an achene with a persistent plumose style. The odor is not distinct. The taste is slightly acrid.

Constituents: Tannin, volatile oil, bitter principle, anemonin (pulsatilla camphor), etc.

Dose: 0.3 Gm. (5 grains).

Preparations:

Tinctura Pulsatillæ; Dose, 2 mls (30 min.).



Stramonium Leaves, 450 lbs. In burlap packing, held by iron bands.

CHAPTER X

LEAVES AND FLOWERING TOPS

IN the study of herbs the following must be considered: Leaves, stems and flowers.

LEAVES

In the study of leaves the following must be considered: Occurrence: petiole,—length, width and nature; blade,—base, margin, apex, outline, size, upper surface, under surface, texture, odor and taste.

1. **Occurrence.** Leaves occur either in broken or in entire condition.

2. **Petiole.** The petiole may be short and slender, as in spearmint, or short and thick, as in belladonna, or long and slender, as in melilotus, or long and thick, as in stramonium.

3. **Blade.** (a) The *base* may be truncate, as in melilotus; or rounded, as in peppermint, spearmint and thyme; or inequilateral, as in henbane; or tapering, as in belladonna and lobelia; or cordate, as in catnep. (b) The *margin* of belladonna, thyme and galega is entire. In peppermint, spearmint, melilotus and grindelia it is serrate. In catnep, lobelia and eupatorium the margin is crenate. In hyoscyamus the margin is lobed. In absinthium and cannabis the margin is divided. (c) The *apex* of melilotus is truncate or notched. The divisions of absinthium leaf are obtuse; of henbane, eupatorium, cataria, lobelia, spearmint, peppermint and thyme, acute; of galega, mucronate. (d) The *outline* of thyme is linear-lanceolate; of spearmint, oblong-lanceolate; of melilotus, oblong-oval; of belladonna, ovate-lanceolate. (e) The *upper surface* embraces the color, the markings and the veins. The color is in most cases dark green. In

henbane it is yellowish green; in belladonna, yellowish brown. In most leaves the surface is dull, but in the *grindelia* species the surface is shiny, because of a layer of resin. Thyme has numerous pits or oil cavities; in belladonna there are numerous holes which extend from the upper to the lower surface of the leaf. The veins are usually on a level with the surface of the leaf tissues. (f) The *under surface* is usually higher colored than the upper; grayish green is the prevailing color. In catnep and eupatorium the under surface is hairy. Many of the other leaves have hairs, but they are not macroscopic. (g) The *texture* of the leaves from the flowering tops is almost without exception thin and papery, and they are very brittle. (h) *Odor*. Belladonna and henbane have a narcotic odor. Thyme, peppermint, spearmint, eupatorium, absinthium and *grindelia* species have an aromatic odor. (i) *Taste*. Thyme, spearmint, peppermint, eupatorium, absinthium and the *grindelia* species have a pungent taste. Absinthium, eupatorium, henbane and belladonna have a bitter taste.

STEMS

In the study of stems, the following must be considered: Occurrence, size, nature, nodes, internodes, texture, color, surface, fracture, outline, cortex, wood and pith.

1. **Occurrence.** The stems occur in the broken or cut condition.

2. **Size.** The size varies from 0.5 mm., as in thymus, to 7 mm., as in henbane.

3. **Nature.** The stems are simple or branched.

4. **Nodes.** The nodes are usually enlarged, and the branches from them may be alternate (one at a node) or opposite (two at a node).

5. **Internodes.** The internodes may be short or long, but in most cases they are of variable length and unimportant.

6. **Texture.** The texture of the stems of thyme is

fibrous and woody, but in the stems found in the other drugs the texture is fibrous and non-woody.

7. **Color.** The color of the stems varies from green to purple to brown to gray.

8. **Surface.** The surface of peppermint, spearmint and catnep is channeled; of lobelia, slightly channeled; absinthium, cannabis and eupatorium are striated; henbane is sunken; absinthium, cannabis, eupatorium and lobelia are hairy.

9. **Fracture.** The fracture of thyme stem is hackly; other stems have an uneven fracture.

10. **Outline.** The outline of peppermint, spearmint and catnip is quadrangular; of cannabis, absinthium, eupatorium and the grindelias, cylindrical; of henbane, sunken.

11, 12, 13. The study of the *cortex*, *wood* and *pith* is not diagnostic.



THYMUS

1, Mass of leaves and flowers. 2, Tops of the plant. 3, Flowers.

THYMUS N. F.

English name: Thyme.

Synonyms: Garden Thyme, Common Thyme.

Botanical origin: *Thymus vulgaris* Linné. (Fam. Labiatæ.)

Part used: Dried tops.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 14 per cent.

Habitat: Southern Europe; cultivated.

Description:

Thyme occurs as broken pieces of the flowering tops, or as a mixture of leaves and flowers. The stems are variable in length and diameter. The stems are simple or branched. The nodes are enlarged. The leaves and branches are opposite. The internodes are variable in length. The texture is fibrous. The color varies from gray to purplish brown. The surface is pubescent. The fracture is tough. The outline of the larger stems is nearly cylindrical, of the smaller stems quadrangular. The cortex is thin and the wood is thick and fibrous. The pith is small and central. The leaves are sessile; the petiole measures up to 2 mm. in length. The blade is slightly rounded and it tapers into the short petiole. The margin is entire and revolute. The apex is acute. The outline varies from linear-lanceolate to ovate-lanceolate. The blade measures up to 8 mm. in length and to 2 mm. in diameter. The upper surface is grayish green and hairy and pitted. The under surface is gray and hairy and pitted. The flowers are arranged in axillary or terminal clusters. The calyx is united below into a tube, free above; the four lobes are subulate. The corolla is united below, free above, and bilabiate; three lobes are short and small, and one lobe is large and emarginate. The andræcium consists of four exserted stamens. The gynæcium consists of one pistil with a four-celled ovary and one curved exserted two-parted style. The fruit consists of four nutlets enclosed in a persistent calyx. The odor is aromatic. The taste is pungent and warming.

Constituents: Volatile oil, tannin, resin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Thymi; Dose, 4 mils (1 fl. dr.).
Oleum Thymi U. S. P.; Dose, 0.2 mil (3 min.).



BELLADONNÆ FOLIA

1, Perforated leaf. 2, Flower. 3, Five stamens. 4, Fruit.
5, Upper and under surface of the fruit. 6, Five-cleft
calyx.

BELLADONNÆ FOLIA (Bellad. Fol.) U. S. P.

English name: Belladonna Leaves.

Synonyms: Deadly Nightshade Leaves, Belladonnæ folium P. I.

Botanical origin: *Atropa Belladonna* Linné. (Fam. *Solanaceæ*.)

Part used: Dried leaves and tops.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: Not less than 0.3 per cent. of total alkaloids.

Ash: Not more than 20 per cent.

Habitat: Central Asia and Central Europe; cultivated in United States.

Description:

Belladonna Leaves occur as a mixture of broken pieces of leaves and flowering tops. The stems measure up to 25 cm. in length and to 12 mm. in diameter. They are simple or branched. The nodes are distinct. The leaves and branches are opposite. The internodes are of variable length. The texture is fibrous. The color varies from green to brownish green. The surface is smooth and sunken. The fracture is brittle. The outline is irregular. The cortex and wood are thin. The pith is large. The leaves have petioles up to 4.5 cm. in length. The base is tapering and narrows into the petiole, or is slightly cordate. The margin is entire. The apex is acute. The outline varies from broadly to narrowly ovate-lanceolate. They measure up to 27 cm. in length and the blade up to 11.7 cm. in width. The upper surface is greenish or yellowish brown, and it usually has several holes of variable size. The under surface is light yellowish or grayish brown, and the veins are prominent. The flowers are axillary. The pedicels measure up to 2.5 cm. The calyx is deeply five-cleft; the divisions are acute. The corolla is campanulate and five-lobed. The andræcium consists of five stamens. The gynæcium consists of one pistil with a two-celled ovary and an exserted style. The fruit is a two-celled berry. The seeds are small and reticulate. The odor is narcotic. The taste is bitter and acrid.

Constituents: Starch, albumin, alkaloids (atropine, hyoscyamine, scopolamine, belladonnine, etc.), chlorophyl, wax, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

Emplastrum Belladonnæ (from extract).
Extractum Belladonnæ Foliorum; Dose, 0.015 Gm. (¼ grain).
Linimentum Belladonnæ (from fluidextract).
Tinctura Belladonnæ Foliorum; Dose, 0.75 mil (12 min.).
Unguentum Belladonnæ (from extract).



GALEGA

1, Compound leaf. 2, Small leaves. 3, Flower cluster and, just below, five fruits.

GALEGA (Galeg.) N. F.

English name: Galega.

Synonyms: European Goat's Rue.

Botanical origin: *Galega officinalis* Linné. (Fam. Leguminosæ.)

Part used: Flowering tops.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Mediterranean region to Central Europe.

Description:

Galega occurs as broken pieces of the leaves and flowering tops. The stems measure up to 2.5 dm. in length and to 4 mm. in diameter. The stems are usually branched. The nodes are distinct. The leaves and branches are alternate. The internodes are of variable length. The texture is fibrous. The color is greenish yellow. The surface is striated. The fracture is uneven. The outline is oblong. The cortex and wood are thin. The pith is hollow. The leaves have petioles which measure up to 2.5 cm. in length. The blade is compound, and is divided into six to eight pairs of leaflets and terminates in one (odd) leaflet. The base of the leaflets is tapering and rounded. The margin is entire. The apex is mucronate. The outline varies from ovate-lanceolate to oblong-lanceolate. The leaflets measure up to 4 cm. in length and to 11 mm. in diameter. The upper and under surfaces are yellowish green and distinctly, finely parallel-veined. The flowers are arranged in racemes, and they are papilionaceous. The bracts are subulate. The pedicels measure up to 5 mm. The calyx is tubular-spreading; the free portion terminates in five subulate lobes. The corolla consists of five petals. The keel is formed of two coherent petals. The wings are of equal size. The standard is large. The andræcium consists of five stamens. The gynæcium consists of one pistil. The fruit is a legume.

Constituents: Bitter principle and tannin. Not fully investigated.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Galegæ; Dose, 4 mls (1 fl. dr.).



MENTHA PIPERITA

1, Stem, leaves and flowers. 2, Petiole. 3, Sharply serrate margin. 4, Acute apex. 5, Flower. 6, Flower spike.

MENTHA PIPERITA (Menth. Pip.) U. S. P.

English name: Peppermint.

Synonyms: Brandy Mint, Lamb Mint.

Botanical origin: *Mentha piperita* Linné. (Fam. *Labiatae*.)

Part used: Leaves and flowering tops.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Europe; naturalized in North America, Nova Scotia to Minnesota, south to Florida and Alabama; cultivated in Japan and United States.

Description:

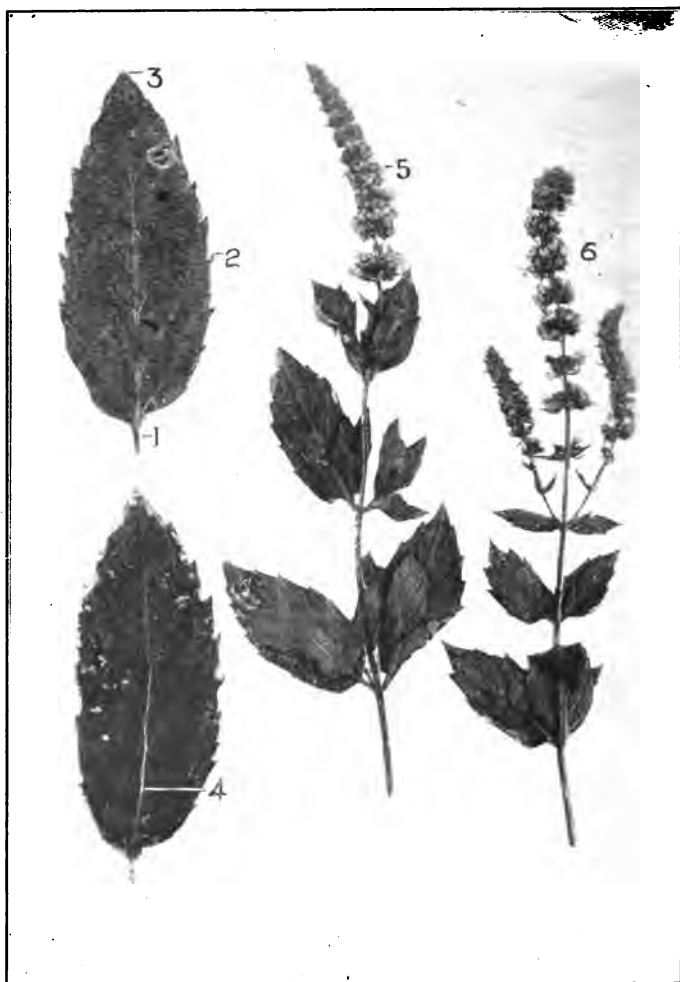
Peppermint occurs as a mixture of entire and broken pieces of the flowering tops with detached and entire and broken leaves. The stems are simple or branched. They measure up to 9.5 cm. in length and to 3.8 cm. in width. The nodes are enlarged. The leaves are opposite. The internodes are of variable length. The texture is fibrous. The color varies from green to purple. The surface is striated longitudinally and channeled on its four sides. The fracture is tough and incomplete. The outline is quadrangular. The cortex and wood are thin. The pith is white, large, and solid or hollow. The petiole of the leaves measures up to 15 mm. The blade is rounded at the base and tapers slightly into the petiole. The margin is sharply serrate. The apex is acute. The outline varies from ovate to ovate-lanceolate. The blade measures up to 7.5 cm. in length and to 32 mm. in width. The upper surface varies in color from yellowish green to purple, and the veins are slightly depressed. The under surface is light green, and the veins are more prominent. The flowers are arranged in dense, broad, interrupted spikes. The bracts are lanceolate. The calyx is campanulate; its five teeth are subulate. The corolla is united and tubular below, four-lobed above; its color varies from light to dark purple. The andræcium consists of four stamens of equal length. The gynæcium consists of one pistil with a four-celled ovary and a two-parted style. The fruit consists of four nutlets enclosed in the persistent calyx. The odor is aromatic. The taste is pungent and finally cooling.

Constituents: Volatile oil, chlorophyl, tannin, resin, gum, etc.

Dose: 4 Gm. (60 grains).

Preparations:

Aqua Menthae Piperitæ (from oil); Dose, 15 mils (4 fl. drs.).
Oleum Menthae Piperitæ; Dose, 0.2 mil (3 min.).
Spiritus Menthae Piperitæ; Dose, 2 mils (30 min.).



MENTHA VIRIDIS

1. Short petiole. 2. Serrate margin. 3. Acute apex. 4. Prominent vein on the under surface. 5. Single spike of flowers. 6. Paniced spike of flowers.

MENTHA VIRIDIS (Menth. Vir.) U. S. P.

English name: Spearmint.

Synonyms: Mint, Brown or Garden Mint.

Botanical origin: *Mentha spicata* Linné (*Mentha viridis* Linné). (Fam. Labiatae.)

Part used: Leaves and flowering tops.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Europe; naturalized in North America, Nova Scotia to Minnesota, south to Florida and Kansas.

Description:

Spearmint occurs as a mixture of entire and broken pieces of the flowering tops with detached and entire and broken leaves. The stems measure up to 40 cm. in length and to 4 mm. in diameter. The nodes are enlarged. The leaves are opposite. The internodes are of variable length. The texture is fibrous. The color varies from green to purplish green. The surface is striated longitudinally and channeled on its four sides. The fracture is tough and incomplete. The outline is quadrangular. The cortex and wood are thin. The pith is large and white. The leaves are sessile above and petioled below. The petiole measures up to 5 mm. in length. The blade is rounded and slightly inequilateral at the base. The margin is sharply serrate; the teeth are usually of unequal length and more abundant near the apex. The apex is usually acute. The outline varies from ovate-lanceolate to oblong-lanceolate. The leaves measure up to 7.5 cm. in length and the blade up to 2.5 cm. in diameter. The upper surface is greenish yellow and green, and the veins are distinct. The under surface is grayish green, and the veins are distinct. The flowers are arranged in long, narrow, acute interrupted spikes. The bracts are lanceolate. The calyx is united into a tube below, free above, and the five teeth are subulate. The corolla is united and tubular below, four-lobed above; it has three short and one long emarginate light purple lobes. The andræcium consists of four stamens of equal length. The gynæcium consists of one pistil with a four-celled ovary and a two-parted style. The fruit consists of four nutlets enclosed by the persistent calyx. The odor is persistently aromatic. The taste is pungent, but not cooling.

Constituents: Volatile oil, tannin, chlorophyl, resin, gum, etc.

Dose: 4 Gm. (60 grains).

Preparations:

Aqua Menthæ Viridis (from oil); Dose, 15 mils (4 fl. drs.).

Oleum Menthæ Viridis; Dose, 0.2 mil (3 min.).

Spiritus Menthæ Viridis (from oil); Dose, 2 mils (30 min.).



MELILOTUS

1, Cluster of young leaves. 2, Leaves of the flowering stalk. 3, Raceme of flowers. 4, Raceme of short hairy pods.

MELILOTUS (Melilot.) N. F.

English name: Melilot.

Synonyms: Yellow Sweet Clover, Yellow Melilot.

Botanical origin: *Melilotus officinalis* (Linné) Lamarck. (Fam. *Leguminosæ*.)

Part used: Leaves and flowering tops.

Impurities: None given.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Europe; naturalized throughout southern Canada and United States.

Description:

Melilot occurs as a mixture of broken and cut pieces of the leaves and flowering tops. The stems measure up to 6 dm. in length and up to 8 mm. in diameter. The stems are branched or simple. The nodes are prominent. The leaves and stems are alternate. The internodes are of variable length. The texture is fibrous. The color varies from light green to greenish purple. The surface is striated and winged. The fracture is fibrous. The outline is angled. The cortex is thin and green. The wood is yellow. The pith is large and hollow. The leaves are trifoliate. The petiole measures up to 2.3 cm. in length. The leaflets have petioles up to 1 mm. in length. The blades are tapering or cuneate at the base. The margin is sharply serrate. The apex is notched, truncate, or rounded. The outline varies from narrowly oblong to oval to obovate. The blades of the flowering branches measure up to 24 mm. in length and up to 5 mm. in width; those of the young, non-flowering branches measure up to 28 mm. in length and up to 14 mm. in width. The upper surface varies from dark to yellowish green. The under surface is grayish green. The veins are distinct on both surfaces; the branches of the midvein terminate in a tooth. The flowers occur in racemes. The pedicels measure up to 2 mm. The calyx is campanulate; the five lobes are subulate and shorter than the tube. The corolla is papilionaceous. The standard is broad and erect. The wings are narrower than the standard, and the keel is shorter and obtuse. The andræcium consists of 10 stamens in two groups. The gynæcium consists of one pistil with a one-celled ovary and a long slender style. The fruit is a short, thick, globose hairy pod, with the persistent base of the style.

Constituents: Cumarin, resin, acid, volatile oil, etc.

Preparations:

None.



GRINDELIA CAMPORUM

1, Leaf with serrate margin and acute apex. 2, Involucres with overlapping recurved bracts. 3, Circle of ray flowers.

GRINDELIA (Grindel.) U. S. P.

(1) *Grindelia camporum*

English name: Grindelia.

Synonyms: Gum Plant.

Botanical origin: *Grindelia camporum* Greene. (Fam. *Compositæ*.)

Part used: Leaves and flowering tops.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: None given.

Ash: None given.

Habitat: California.

Description:

Grindelia camporum occurs as broken and entire pieces of the leaves and flowering tops. The stems measure up to 30 cm. in length and to 2 cm. in diameter. They are branched. The nodes are small. The leaves and branches are alternate. The internodes are of variable length. The texture is fibrous. The color is pinkish yellow. The surface is striated. The fracture is fibrous. The outline is nearly cylindrical. The cortex and wood are thin, the pith is large. The leaves are sessile and clasping. The base of the blade is subcordate. The margin is serrate and the teeth are irregularly placed. The apex is acute. The outline of the basal leaves is oblong-spatulate, of the upper leaves oblong. The blade measures 6.2 cm. or less in length and 15 mm. or less in width, the narrowest part frequently being in the middle of the length. The upper surface is pale bright green, resinous and shiny, and the veins are even with the surface. The under surface is lighter and the veins are elevated and indistinct near the apex. The flowers are arranged in corymbs. The bracts subtending each flower are entire, clasping and linear-lanceolate. The involucre is 24 mm. or less in width. The bracts are long, linear and the tips are recurved. All parts of the involucre are resinous. The ray flowers are pistillate, orange brown and ligulate. The disk flowers are light yellow and perfect. The disk achenes are angled, compressed and biauriculate. The odor is slightly aromatic. The taste is aromatic and bitter.

Constituents: Volatile oil, resin, saponin, grindelin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Grindeliæ; Dose, 2 mls (30 min.).



GRINDELIA CUNEIFOLIA

1, Portion of the root. 2, Large basal leaf. 3, Small stem leaf. 4, Involucre. 5, Ray flowers.

GRINDELIA (Grindel.) U. S. P.

(2) *Grindelia Cuneifolia*

English name: Grindelia.

Synonyms: None in common use.

Botanical origin: *Grindelia cuneifolia* Nuttall. (Fam. Compositæ.)

Part used: Leaves and flowering tops.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Rocky Mountains, Mexico and California.

Description:

Grindelia cuneifolia occurs as entire and broken pieces of the leaves and flowering tops. The stems measure up to 35 cm. in length and to 2 mm. in diameter, and they are branched. The nodes are slightly enlarged. The leaves and branches are alternate. The internodes are of variable length. The texture is fibrous. The color varies from pink to purplish brown. The surface is finely striated. The fracture is uneven. The outline is nearly cylindrical. The leaves are sessile and clasping. The blade is subcordate at the base. The margin is entire below, serrate above and the entire margin is ciliate. The apex is acute. The outline is oblong. The blade measures 9.7 cm. or less in length and 27 mm. or less in width. The upper surface is light green, pitted and slightly impressed. The under surface is free of resin and it is slightly wrinkled, and the veins are broad, purple and elevated. The flowers are arranged in corymbs. The bracts subtending the flowers are entire, clasping and recurved. The involucre is 28 mm. or less in width. The bracts are resinous, imbricate, and the tips are green and recurved. The ray flowers are yellowish, ligulate and pistillate. The disk flowers are yellow and perfect. The disk achenes are dentate and auriculate and compressed. The odor is slightly aromatic. The taste is aromatic and bitter.

Constituents: Volatile oil, resin, saponin, grindelin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Grindelie; Dose, 2 mls (30 min.).



GRINDELIA SQUARROSA

1, Leaf of the stem. 2, Involucre. 3, Ray flowers.

GRINDELIA (Grindel.) U. S. P.

(3) *Grindelia squarrosa*

English name: Grindelia.

Synonyms: Broad-leaved Gum Plant.

Botanical origin: *Grindelia squarrosa* (Pursh)
Dunal.

Part used: Dried leaves and flowering tops.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Minnesota to Manitoba, south to Missouri and Texas.

Description:

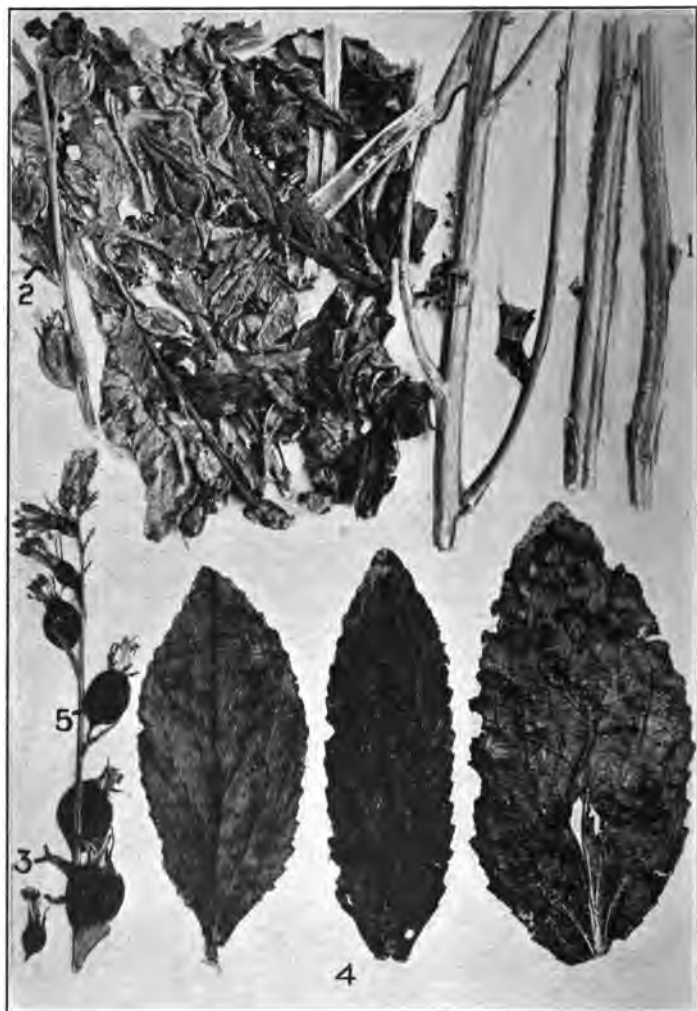
Grindelia squarrosa occurs as entire and broken pieces of the leaves and flowering tops. The stems measure up to 30 cm. in length and to 2 mm. in diameter, and they are branched. The nodes are slightly enlarged. The leaves and branches are alternate. The leaves occur at more frequent intervals than in the Nos. 1 and 2. The internodes are only short distances apart. The texture is fibrous. The color varies from grayish to yellowish. The surface is striated. The fracture is uneven. The outline is nearly cylindrical. The leaves are sessile and clasping. The blade is subcordate at the base. The margin is dentate. The apex is obtuse. The outline is oblong. The blade measures 4.5 cm. or less in length and 15 mm. or less in diameter. The upper surface is grayish green and the veins are not prominent. The under surface is pellucid-punctate and the veins are slightly elevated. The flowers are arranged in corymbs. The bracts subtending the flowers are very small and they resemble the leaves. The involucre is 0.5 mm. or less in width and its bracts are linear-lanceolate, the tip subulate and recurved. The ray flowers are yellowish, ligulate and pistillate. The disk flowers are yellowish and perfect. The disk achenes are four-angled and without a border above. The odor is slightly aromatic. The taste is aromatic and bitter.

Constituents: Volatile oil, resin, saponin, grindelin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Grindeliæ; Dose, 2 mls (30 min.).



LOBELIA

1, Channeled and winged stems. 2, Mass of leaves, fruits and stems. 3, Inflated calyx. 4, Three types of leaves. 5, Raceme of flowers.

LOBELIA (Lobel.) U. S. P.

English name: Lobelia.

Synonyms: Indian Tobacco, Lobelia Herb, Puke-weed.

Botanical origin: *Lobelia inflata* Linné. (Fam. *Lobeliaceæ*.)

Part used: Leaves and flowering tops.

Impurities: Not more than 10 per cent. of stems or other matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Canada and the United States, south to Georgia and Arkansas.

Description:

Lobelia occurs as entire and broken pieces of the leaves and flowering tops. The *stems* measure up to 40 cm. in length and to 8 mm. in diameter. They are usually branched. The *nodes* are prominent. The *leaves* and *branches* are alternate. The *internodes* are of variable length. The *texture* is fibrous. The *color* varies from green to purple. The *surface* is channeled, winged and hirsute. The *fracture* is fibrous. The *outline* is angled. The *cortex* and *wood* are thin. The *pith* is large and white. The *leaves* have *petioles* that measure up to 2 mm., or they are sessile. The *blade* is rounded or tapering at the base. The *margin* is crenate. The *apex* is obtuse or acute. The *outline* is ovate-oval or oblong-oval. The *blade* measures up to 5.5 cm. in length and up to 27 mm. in diameter. The *upper surface* varies in color from green to purple and the veins are impressed. The *under surface* varies in color from green to yellow to purple and the veins are prominent. The *flowers* are arranged in racemes. The *bracts* subtending each flower are ovate or ovate-lanceolate. The *pedicels* are slender and they measure up to 5 mm. The *calyx* is united and tubular below; the free portion terminates in five subulate teeth. The *corolla* is united below; the free portion terminates in five acute lobes. The *androeium* consists of five stamens; their anthers are united and enclose the style. The *gynaeium* consists of one pistil with a two-celled ovary and a two-parted stigma. The *fruit* is a two-celled capsule with numerous reticulate seeds. The *odor* is not characteristic. The *taste* is strongly acrid.

Constituents: Alkaloid (lobeline), gum, resin, fixed and volatile oils, etc.

Dose: 0.15 Gm. (2½ grains).

Preparations:

Fluidextractum Lobeliae; Dose, 0.15 mil (2½ min.).
Tinctura Lobeliae; Dose, 1 mil (15 min.).



CATARIA

1, Upper surface of the crenate margined leaf. 2, Under surface showing the venation. 3, Spike of flowers. 4, Seeds. 5, Flowers.

CATARIA (Catar.) N. F.

English name: Catnep.

Synonyms: Catmint, Catnip.

Botanical origin: *Nepeta Cataria* Linné. (Fam. *Labiatæ*.)

Part used: Leaves and flowering tops.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 16 per cent.

Habitat: Europe; naturalized in North America, from New Brunswick south to Georgia and Kansas.

Description:

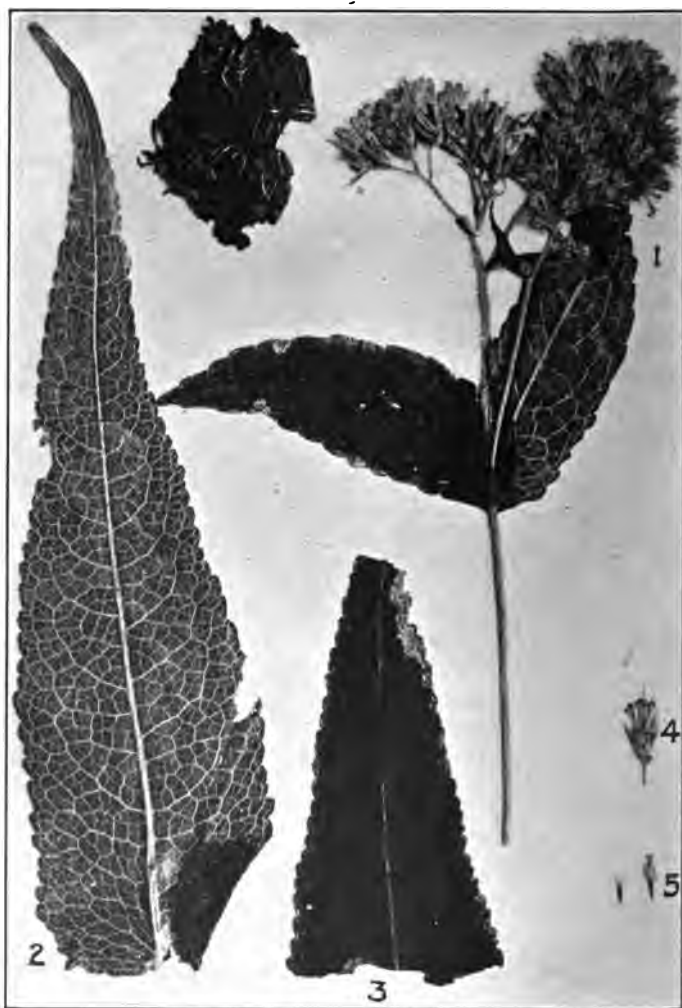
Catnep occurs as a mixture of entire and broken pieces of the leaves and flowering tops. The stems measure up to 6 dm. in length and to 8 mm. in diameter. They are simple and branched. The nodes are enlarged. The leaves are opposite. The internodes are of variable length. The texture is fibrous. The color is grayish green. The surface is hairy and channeled on its four sides. The fracture is fibrous. The outline is quadrangular. The cortex and wood are thin. The pith is large, solid or hollow. The petioles of the leaves measure up to 4 cm. in length. The blade of the larger leaves is cordate, of the smaller upper leaves rounded. The margin is coarsely crenate. The apex is acute. The outline varies from ovate to triangular-ovate. The leaves measure up to 15 cm. in length and the blades to 5.6 cm. in width. The upper surface varies from green to yellowish green and the veins are distinct. The under surface is grayish green; the veins are prominent and hairy. The flowers are arranged in axillary or terminal spikes. The calyx is united, tubular below, indistinctly two-lipped, and five-toothed. The corolla is bilabiate and spotted. The andræcium consists of four stamens, two short and two long. The gynæcium consists of one pistil with a four-celled ovary and a two-cleft style. The fruit consists of four nutlets enclosed in the persistent calyx. The taste is aromatic. The odor is pungent and bitter.

Constituents: Volatile and fixed oils, wax, gum, tannin, sugar, bitter principle, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Cataris; Dose, 4 mls (1 fl. dr.).



EUPATORIUM

1, Portion of the stem with leaves and flowers. 2, Under surface of the leaf. 3, Upper surface of the leaf. 4, Head of flowers. 5, Single flower and, to the left, a fruit.

EUPATORIUM (Eupator.) N. F.

English name: Eupatorium.

Synonyms: Boneset, Thoroughwort.

Botanical origin: *Eupatorium perfoliatum* Linné.
(Fam. *Compositæ*.)

Part used: Leaves and flowering tops.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: New Brunswick to Manitoba, south to Florida and Texas.

Description:

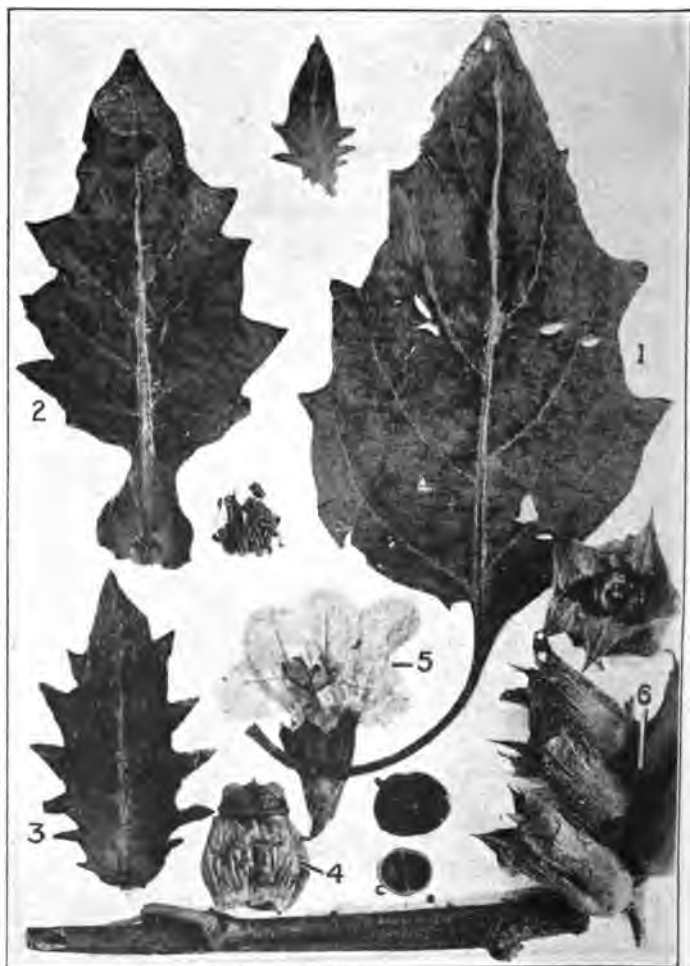
Eupatorium occurs as broken pieces of the leaves and flowering tops. The stems measure up to 6 mm. in diameter. They are simple or branched. The nodes are distinct. The leaves are opposite; the pairs on the lower portions of the stems unite at their bases, forming connate-perfoliate leaves. The internodes are of variable length. The texture is fibrous. The color is yellowish green. The surface is longitudinally striated and hairy. The fracture is fibrous. The outline is cylindrical and wavy. The cortex and wood are thin. The pith is large and white. The leaves are sessile. The blade is connate or cordate at the base. The margin is crenate. The apex is narrowly acuminate. The outline is lanceolate-acuminate. The blades of the leaves measure up to 20 dm. in length and to 4.5 cm. in width. The upper surface varies in color from green to yellowish green. The under surface is yellowish green and hairy, and has numerous yellow, shiny, minute, glandular hairs. The veins are yellowish white. The flowers are arranged in corymbs. The involucre consists of two or three series of lanceolate imbricated greenish gray bracts. No ray flowers are present. The disk flowers are perfect. The fruit is a five-angled achene with a persistent pappus in one row. The odor is slightly aromatic. The taste is strongly bitter.

Constituents: Volatile oil, tannin, resin, coloring matter, wax, glucoside (eupatorin), etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Eupatorii; Dose, 2 mls (30 min.).



HYOSCYAMUS

1, Leaf from the lower part of the stem. 2, Upper stem leaves. 3, Leaf bract subtending the flower and fruit. 4, Two-celled pyxis. 5, Flowers. 6, Persistent five-toothed calyx inclosing the fruit.

HYOSCYAMUS (Hyo.) U. S. P.

English name: Hyoscyamus.

Synonyms: Henbane, *Hyoscyami folium* P. I.

Botanical origin: *Hyoscyamus niger* Linné. (Fam. *Solanaceæ*.)

Part used: Leaves and flowering or fruiting tops.

Impurities: None given.

Assay: Not less than 0.065 per cent. of alkaloids.

Ash: Not more than 30 per cent.

Habitat: Europe and parts of Asia; cultivated in United States.

Description:

Hyoscyamus occurs as a mixture of entire and broken pieces of the leaves and flowering tops, adhering in masses. The *stems* measure up to 20 cm. in length and to 4 cm. in diameter. They are simple or branched. The *nodes* are distinct. The *leaves* and *branches* are alternate. The *internodes* are variable in length. The *texture* is fibrous. The *color* varies from gray to brownish green. The *surface* is rough, hairy and sunken. The *fracture* is brittle. The *outline* is irregular. The *cortex* is green and thin. The *wood* is thin. The *pith* is hollow. The *leaves* have petioles up to 30 cm. in length. The upper leaves are sessile. The *blade* is inequilateral at the base. The *margin* has from one to six acute-angled lobes or teeth. The *apex* is acute. The *outline* is ovate or oblong. The leaves measure up to 26 cm. in length and the blade up to 28 cm. in width. The *upper surface* varies in color from dark green to yellowish green. The *under surface* is grayish green and hairy. The *midvein* is broad and yellowish on both surfaces; the *branches* are small and curve upward and outward toward the teeth or lobes. The *flowers* are in spikes or racemes. The *pedicle* measures up to 3 mm. The *calyx* is urn-shaped and five-toothed above. The *corolla* is yellow-spotted and campanulate; the five lobes are rounded and prominently veined. The *androecium* consists of five stamens. The *gynæcium* consists of one pistil with a two-celled ovary and one style. The *fruit* is a two-celled pyxis. The *seeds* are small, biconcave and reticulate. The *odor* is narcotic. The *taste* is bitter and acrid.

Constituents: Alkaloids (hyoscyamine, hyoscyne), resin, fixed oil, choline, etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

Extractum Hyoscyami; Dose, 0.06 Gm. (1 grain).

Fluidextractum Hyoscyami; Dose, 0.2 mil (3 min.).

Oleum Hyoscyami Compositum N. F. (for external use).

Tinctura Hyoscyami; Dose, 2 mils (30 min.).



ABSINTHIUM

1, Mass of leaves and stems. 2, Large stem. 3, Compound leaf. 4, Paniced raceme of heads.

ABSINTHIUM (Absinth.) N. F.

English name: Absinthium.

Synonyms: Wormwood.

Botanical origin: *Artemisia Absinthium* Linné.
(Fam. *Compositæ*.)

Part used: Leaves and flowering tops.

Impurities: Not more than 5 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Europe, Northern Asia, and Africa. Naturalized in the Northeastern United States.

Description:

Absinthium occurs as broken pieces of the leaves and flowering tops. The *stems* measure up to 30 cm. in length and to 6 mm. in diameter. They are simple or branched. The *nodes* are distinct. The *leaves* are alternate. The *internodes* are of variable length. The *texture* is fibrous. The *color* is grayish and yellowish green. The *surface* is canescent. The *fracture* is fibrous. The *outline* is cylindrical. The *cortex* and *wood* are thin. The *pith* is hollow. The *petioles* of the leaves measure up to 2 cm. The upper leaves are frequently sessile. The *blade* is 1 to 3 times pinnately divided; the ultimate divisions are oblong-lanceolate and obtuse. The *margin* is divided. The *apex* of the divisions is obtuse. The leaves measure up to 15 cm. in length and to 14 cm. in width. The *upper surface* is dark grayish green and canescent. The *under surface* is light grayish green and canescent; and the midvein of each division is prominent. The *flowers* are in heads, arranged in panicled racemes. The *peduncle* is short. The *involucre* consists of several rows of imbricated bracts; the outer ones are short and the inner have scarious margins. No *ray flowers* are present. The *disk flowers* of the margin are pistillate. The *fruits* are striate and winged achenes, with a persistent disk. The *receptacle* is convex and pubescent. The *odor* is aromatic. The *taste* is pungent and strongly bitter.

Constituents: Volatile oil, bitter principles, starch, tannin, succinic acid, etc.

Dose: 2 Gm. (30 grains).

Preparations:

None.



CANNABIS—AMERICAN

1, Leaves, fruits and small stems. 2, Small branch with leaf-like bracts. 3, Part of a broad leaflet.

CANNABIS (Cannab.) U. S. P.

(1) American Cannabis*

English name: Cannabis.

Synonyms: American Cannabis.

Botanical origin: *Cannabis sativa* Linné. (Fam. Moraceæ.)

Part used: Flowering tops.

Impurities: Not more than 10 per cent. of fruits or other foreign matter.

Assay: Biologically assayed.

Ash: Not more than 15 per cent.

Habitat: Southern United States.

Description:

American Cannabis occurs as broken pieces of the leaves and flowering tops. The stems are of variable length and they must not measure more than 3 mm. in diameter. The drug of commerce frequently has stems 6 mm. in diameter. They are branched. The nodes are distinct. The branches are alternate. The internodes are of variable length. The texture is fibrous. The color varies from light brown to brownish green. The surface is longitudinally furrowed and covered with short hairs. The fracture is uneven. The outline is wavy. The cortex and wood are thin. The pith is white and porous. The leaves are light green and have petioles which measure 6.5 cm. or less in length. The blade is palmately divided into nine or fewer leaflets. The leaflets are sessile. The base is tapering. The margin is sharply serrate. The apex is acuminate. The veins are pinnate, impressed above, elevated below. The flowers are arranged in short spikes on a peduncle which measures up to 12.5 cm. in length and is of variable width. The bracts or leaves subtending the spikes have (usually) three large and two small leaflets; the bracts subtending the individual flowers, three small leaflets. The flowers have a greenish calyx. The gynoecium has one pistil with a reddish brown, filiform, two-parted style. The fruit is an achene enclosed by the persistent calyx. The odor is aromatic. The taste is pungent and resinous.

Constituents: Volatile oil, resin, bitter principle, gum, sugar, potassium nitrate, alkaloids, etc.

Dose: None given.

Preparations:

Extractum Cannabis; Dose, 0.01 Gm. ($\frac{1}{16}$ grain).

Fluidextractum Cannabis; Dose, 0.1 mil ($1\frac{1}{2}$ min.).

Tinctura Cannabis; Dose, 0.75 mil (12 min.).



CANNABIS—AFRICAN

1, Portion of a disk composed of the compressed drug. 2, Single stem with flowers, fruits and bracts. 3, Irregular fragment of the drug.

CANNABIS (Cannab.) U. S. P.

(2) African Cannabis

English name: Cannabis.

Synonyms: African Cannabis.

Botanical origin: *Cannabis sativa*, var. *indica*. (Fam. *Moraceæ*.)

Part used: Flowering tops.

Impurities: Not more than 10 per cent. of fruits or other foreign matter.

Assay: Biologically assayed.

Ash: Not more than 15 per cent.

Habitat: Africa.

Description:

African Cannabis occurs as broken pieces of the leaves and flowering tops. The stems are of variable length and they must not measure more than 3 mm. in diameter. They are branched. The nodes are distinct and the branches are alternate. The internodes are of variable length. The texture is fibrous. The color is greenish brown. The surface is longitudinally furrowed and short hairy. The fracture is uneven. The outline is wavy. The cortex and wood are thin. The pith is white and porous. The stem leaves are rarely present. The flowers are arranged in short spikes on a peduncle which rarely exceeds 7 cm. in length. The bracts subtending the spikes are divided into five linear leaflets. The bracts subtending the individual flowers usually have three minute leaflets. The flowers have a green calyx. The gynæcium consists of one pistil with a reddish brown two-parted filiform style. The fruit is an achene and is enclosed by the persistent calyx. The odor is aromatic. The taste is pungent and resinous.

Constituents: Volatile oil, resin, bitter principle, gum, sugar, potassium nitrate, alkaloids, etc.

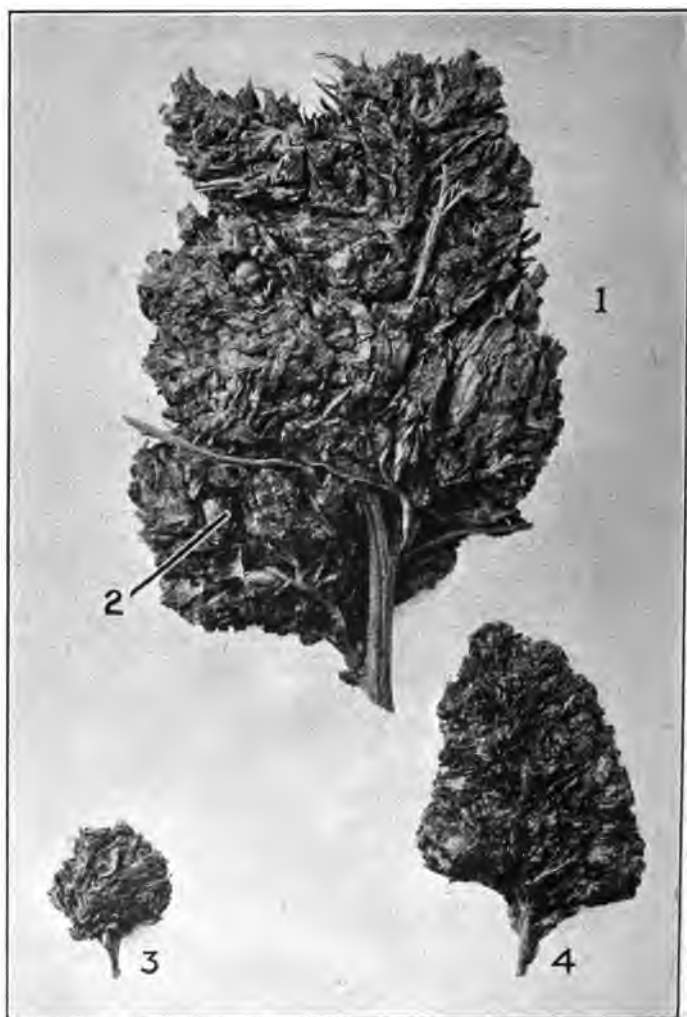
Dose: None given.

Preparations:

Extractum Cannabis; Dose, 0.01 Gm. ($\frac{1}{16}$ grain).

Fluidextractum Cannabis; Dose, 0.1 mil ($1\frac{1}{2}$ min.).

Tinctura Cannabis; Dose, 0.75 mil (12 min.).



CANNABIS—INDIAN

1, Large resinous branch. 2, Seed. 3, Small branches without seed. 4, Larger branch.

CANNABIS (Cannab.) U. S. P.

(3) Indian Cannabis

English name: Cannabis.

Synonyms: Indian Hemp, Guaza, Ganjah.

Botanical origin: *Cannabis sativa*, var. *indica*. (Fam. *Moraceæ*.)

Part used: Flowering tops.

Impurities: Not more than 10 per cent. fruits or other foreign matter.

Assay: Biologically assayed.

Ash: Not more than 15 per cent.

Habitat: East Indies.

Description:

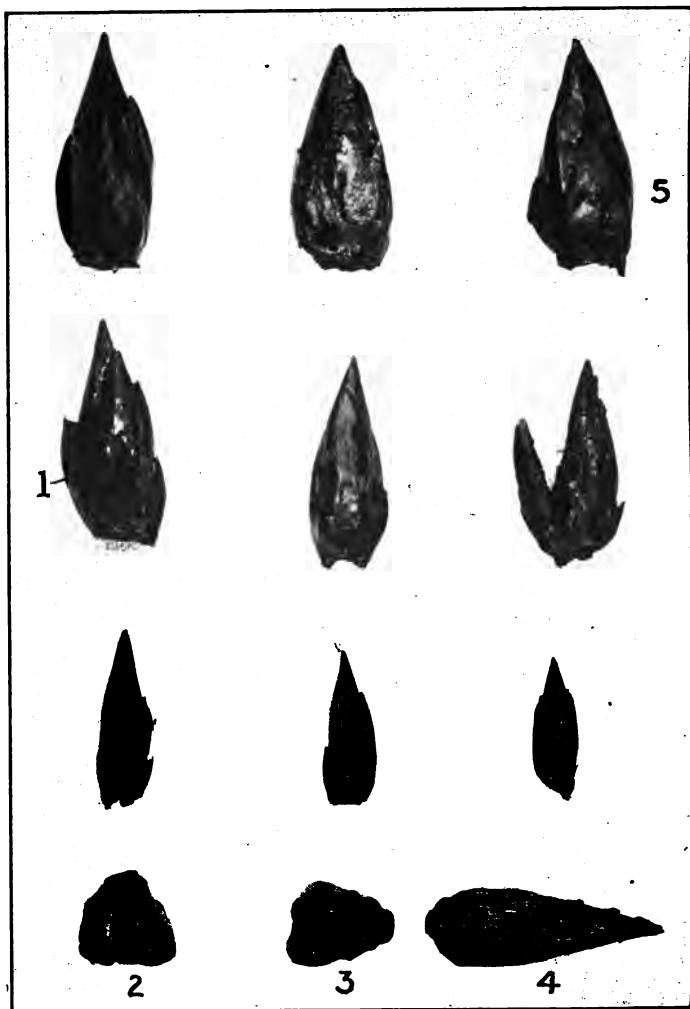
Indian Cannabis occurs as broken pieces of leaves and flowering tops. The stems vary in length and they must not exceed 3 mm. in diameter. They are branched. The nodes are distinct. The branches are alternate. The internodes are of variable length. The texture is fibrous. The color is grayish brown. The surface is longitudinally furrowed and short hairy. The fracture is uneven. The outline is wavy. The cortex and wood are thin. The pith is white and porous. Stem leaves are rarely present. The flowers are arranged in short broad spikes on a peduncle which rarely exceeds 7 cm. in length and which is frequently 4.5 cm. wide. The bracts subtending the spikes and flowers are short and the leaflets vary from three to five. The flowers have a grayish green hairy calyx. The gynæcium consists of a single pistil with a reddish brown two-parted filiform style. The fruit is an achene and is enclosed by the persistent calyx. The odor is aromatic. The taste is pungent and resinous.

Constituents: Volatile oil, resin, bitter principle, gum, sugar, potassium nitrate, alkaloids, etc.

Dose:

Preparations:

Extractum Cannabis; Dose, 0.01 Gm. ($\frac{1}{32}$ grain).
Fluidextractum Cannabis; Dose, 0.1 mil ($1\frac{1}{2}$ min.).
Tinctura Cannabis; Dose, 0.75 mil (12 min.).



**POPULI GEMMÆ—
BALM OF GILEAD BUDS**

1, Overlapping scale of the bud. 2, Base of the bud. 3, Cross-section of the bud. 4, Longitudinal section of the bud. 5, A very large bud.

POPULI GEMMÆ (Pop. Gem.) N. F.

(1) Balm of Gilead Buds

English name: Balsam Poplar Buds.

Synonyms: Balm of Gilead Buds.

Botanical origin: *Populus balsamifera* Linné. (Fam. *Salicaceæ*.)

Part used: Leaf buds.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Northern North America, south to New York and Nevada.

Description:

Balm of Gilead Buds occur as solitary buds and agglutinated masses of buds. These buds are sessile. They measure up to 18 mm. in width and up to 28 cm. in length. The buds are simple or clustered in twos, or in threes occasionally. The *base* is truncate or depressed. The *margin* has projecting points of scales. The *apex* is acute. The *outline* varies from ovate to ovate-lanceolate. The *surface* of the imbricated scales is smooth, and is covered with a thin coat of sticky resin. The *inner surface* is more sticky than the outer. The scales enclose numerous undeveloped leaves. The *color* is reddish brown. The *odor* is balsamic. The *taste* is pungent and bitter.

Constituents: Volatile oil, populin, salicin, resin, etc.

Dose: None given.

Preparations:

None. Enters into Syrupus Pini Ströbi Compositus.



POPULI GEMMÆ—BLACK POPLAR BUDS

1, Mass of buds. 2, Buds of different sizes. 3, Portion of the stem.

POPULI GEMMÆ (Pop. Gem.) N. F.

(2) Black Poplar Buds

English name: Balsam Poplar Buds.

Synonyms: Black Poplar Buds, Willow Poplar Buds.

Botanical origin: *Populus nigra* Linné. (Fam. *Salicaceæ*.)

Part used: Leaf buds.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Europe; naturalized in the Delaware River and Hudson River valleys and Staten Island.

Description:

Black Poplar Buds occur only as solitary buds and never as agglutinated masses. These buds are sessile or short-stalked. They measure up to 6 mm. in width and up to 15 mm. in length. The buds are simple or rarely clustered. The base is truncate. The margin has imbricated projecting scales. The apex is acuminate. The outline is lanceolate. The surface of the imbricated scales is smooth and free of sticky resin. The central scales are slightly sticky. The color varies from yellowish brown to blackish brown. The odor is balsamic. The taste is pungent and bitter.

Constituents: Volatile oil, populin, salicin, resin, etc.

Dose: None given.

Preparations:

None. Enters into Syrupus Pini Strobi Compositus.

CHAPTER XI

LEAVES

IN the study of leaves the following must be considered: Occurrence; petiole,—length, width, etc.; blade,—base, margin, apex, outline, size, upper surface, under surface, texture, odor and taste.

1. **Occurrence.** Leaves usually occur in a broken or partially broken condition, as in mullein; or as entire leaves, as in eucalyptus.

2. **Petiole.** The petioles of leaves vary greatly in the different leaves. In damiana they are slender and short; in matico they are short and thick; in low mallow they are long and slender; in coltsfoot they are very long; some of the leaves have a maximum length of 5.5 dm. In mullein and digitalis the petiole is margined; in coltsfoot the petiole is channeled on the upper surface; in eucalyptus the petiole is frequently twisted; in coltsfoot and marshmallow leaves the petioles are hairy; in most of the leaves the petioles are glabrous (without hairs).

3. **Blade.** (a) The *base* is cordate in matico, farfara and low and high mallow; it is subcordate in marshmallow; rounded, as in boldo; cuneate, as in uva ursi and short buchu; tapering, as in digitalis, mullein, eriodictyon and long buchu. (b) The *margin* in eucalyptus, mullein, matico, boldo and uva ursi is entire. In buchu, chimaphila, damiana, castanea and eriodictyon it is serrate; in digitalis, dentate; in hamamelis, crenate; and in malvæ folia, coltsfoot, stramonium and menyanthes, lobed. (c) The *apex* of long buchu is truncate; of menyanthes and farfara, rounded or obtuse; of stramonium, althæa, digitalis, eriodictyon and short buchu, acute; in eucalyptus, matico and castanea, acuminate. (d) The *outline* of long buchu is oblong-linear; of castanea,

oblong-lanceolate; of eucalyptus, falcate; of boldo, oval; of menyanthes, obovate; of low malva, rotund; and of farfara, reniform. (e) The *upper surface* includes the consideration of the color, the markings and the veins. The color of the upper surface is usually dark green; exceptions occur, however, in a number of leaves: eucalyptus is bluish green; eriodictyon is brown; short buchu is yellowish green. In most leaves this surface is dull, but in buchu, uva ursi and chimaphila the surface is shiny. Most of the leaves are not hairy, but mullein and althæa are very hairy or tomentose. The surface of eriodictyon is shiny from a coat of resin; in matico it is elevated between the veins; in boldo it is papillose; and in short buchu it is pellucid-punctate. The veins are usually not conspicuous on the upper surface. In boldo, chimaphila and althæa the veins are impressed. (f) The *under surface* of most leaves is lighter in color than the upper surface; grayish green is the most common color. In eucalyptus the surface is bluish green; in short buchu, yellow; in coltsfoot, light gray; etc. In most leaves the under surface is dull and smooth; in witch-hazel leaves it is very shiny; in mullein and althæa, densely hairy; in matico the hairs are more abundant on the veins; in damiana and malva the surface is only slightly hairy. The veins are usually elevated more on the under than on the upper surface, and in every leaf their arrangement must be noted. Refer to eucalyptus, to large pilocarpus and to castanea. (g) The *texture* of most leaves is thin and papery, and they are very brittle; in eucalyptus, castanea, witch-hazel, etc., the texture is leathery (coriaceous), and tough. (h) *Odor*. Most leaves are odorless, but stramonium has a narcotic odor; eriodictyon, long and short buchu, matico and eucalyptus are aromatic. (i) Eriodictyon, long and short buchu, matico and eucalyptus have a pungent *taste*; chimaphila, castanea and uva ursi, an astringent taste; mullein and malva leaves, a mucilaginous taste; and menyanthes, farfara and digitalis, a bitter taste.



EUCALYPTUS

1, Upper surface of the leaf at the left; under surface at the right. 2, An older fruit with the lid removed. 3, Persistent stamen and a central style. 4, Lid of the fruit. 5, Side view of a young fruit.

EUCALYPTUS (Eucalypt.) U. S. P.

English name: Eucalyptus.

Synonyms: Blue Gum Leaves.

Botanical origin: *Eucalyptus Globulus* Labillardière.
(Fam. *Myrtaceæ*.)

Part used: Leaves collected from older parts of the tree.

Impurities: Not more than 3 per cent. of stems, fruits or other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Australia; cultivated in California and subtropics.

Description:

Eucalyptus occurs as a mixture of entire and broken leaves. The *petioles* are twisted, and they measure up to 25 cm. in length. The *blade* is inequilateral, rounded, or tapering at the base. The *margin* is entire. The *apex* is acuminate or acute. The *outline* varies from falcate to oblong-lanceolate. The *blade* measures up to 6 cm. in width and to 33 cm. in length. The *upper surface* and the *lower surface* vary in color from grayish to yellowish or to bluish green, and they are pellucid-punctate. The branches of the midvein unite into one vein, which occurs a short distance from and parallel to the margin of the leaf. The *texture* is coriaceous. The *odor* is aromatic. The *taste* is pungent and bitter.

Constituents: Volatile oil, tannin, resins, eucalyptic acid, bitter principle, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Eucalypti; Dose, 2 mils (30 min.).
Oleum Eucalypti; Dose, 0.5 mil (8 min.).



VERBASCI FOLIA

- 1, Petiole of leaf. 2, Smaller leaf, the surface tomentose.
3, Very small leaf.

VERBASCI FOLIA (Verbasc. Fol.) N. F.

English name: Mullein Leaves.

Synonyms: Common Mullein, Velvet or Mullein Dock.

Botanical origin: *Verbascum Thapsus* Linné and other species of *Verbascum*. (Fam. *Scrophulariaceæ*.)

Part used: Leaves.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 14 per cent.

Habitat: Europe; naturalized in North America, south to Florida and Kansas.

Description:

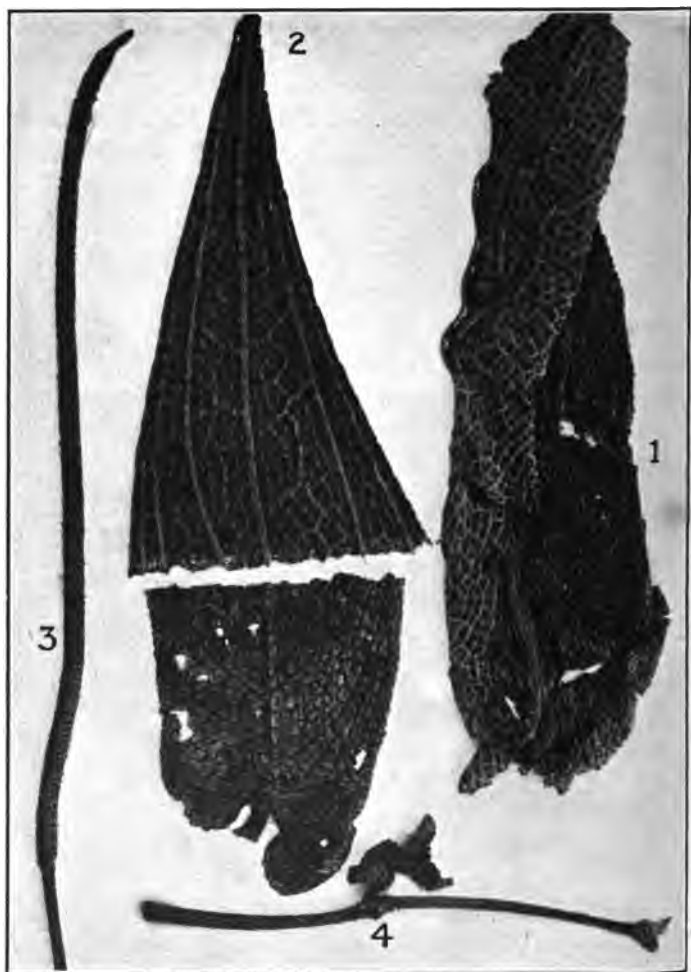
Mullein Leaves occur as a mixture of entire and broken pieces of the leaves. No *petioles* are present, although the constricted blade resembles a petiole. The *blade* is tapering at the base. The *margin* is entire. The *apex* is acute or obtuse. The *outline* varies from oblong-lanceolate to ovate to oblong. The *blades* measure 36 cm. or less in length and 12 cm. or less in width. The *upper surface* is tomentose, and it varies in color from yellowish to greenish gray; the veins are not seen on account of the long hairs. The *under surface* is similar to the upper surface. The *texture* is hairy. The *odor* is not distinct. The *taste* is bitter, mucilaginous and irritating on account of the hairs.

Constituents: Volatile oil, wax, resin, tannin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Verbasci Foliae; Dose, 4 mil (1 fl. dr.).



MATICO

1, Folded leaf. 2, Under-surface of the leaf. 3, Flower spike. 4, A piece of stem and, above, the upper surface of the leaf.

MATICO (Matic.) N. F.

English name: Matico.

Synonyms: Matico Leaves.

Botanical origin: *Piper angustifolium* Ruiz et Pavon.
(Fam. *Piperaceæ*.)

Part used: Leaves.

Impurities: Not more than 5 per cent. of stems, flowers, spikes or other foreign matter.

Assay: None given.

Ash: Not more than 18 per cent.

Habitat: Mountains of Peru, Bolivia and Brazil.

Description:

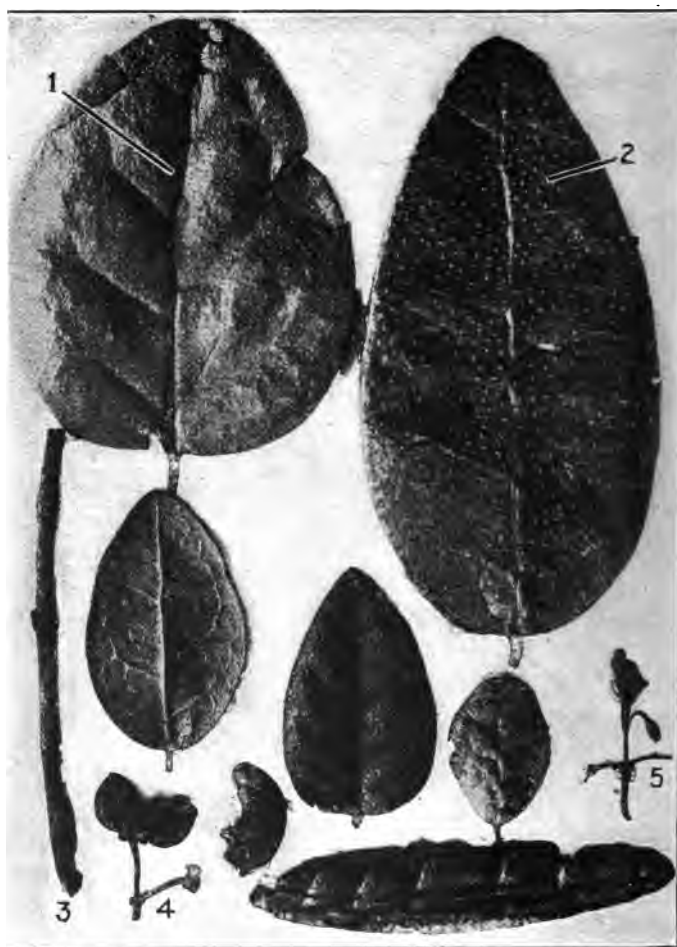
Matico occurs as a mixture of entire, broken and folded leaves. The petioles are stout and they measure up to 6 mm. in length. The blade is inequilateral and cordate at the base. The margin is entire. The apex is acuminate. The outline is oblong-lanceolate. The blade measures up to 25 cm. in length and to 6 cm. in width. The upper surface is cancellate; the veins are not distinct and the color varies from dark green to yellowish green. The under surface is bullate; the veins are pubescent, parallel and reticulate. The odor is aromatic. The taste is pungent, resembling pepper.

Constituents: Tannin, volatile oil, bitter principle, resin, mucilage, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Matico; Dose, 4 mls (1 fl. dr.).



BOLDO

1, Broad leaf with deeply impressed veins. 2, Coarsely papillose upper surface. 3, Stem. 4, Fruit. 5, Flower buds.

BOLDO N. F.

English name: Boldo.

Synonyms: Boldo Leaves.

Botanical origin: *Boldu Boldus* (Molina) Lyons.
(Fam. *Monimiaceæ*.)

Part used: Leaves.

Impurities: Not more than 2 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Mountain regions of Chile.

Description:

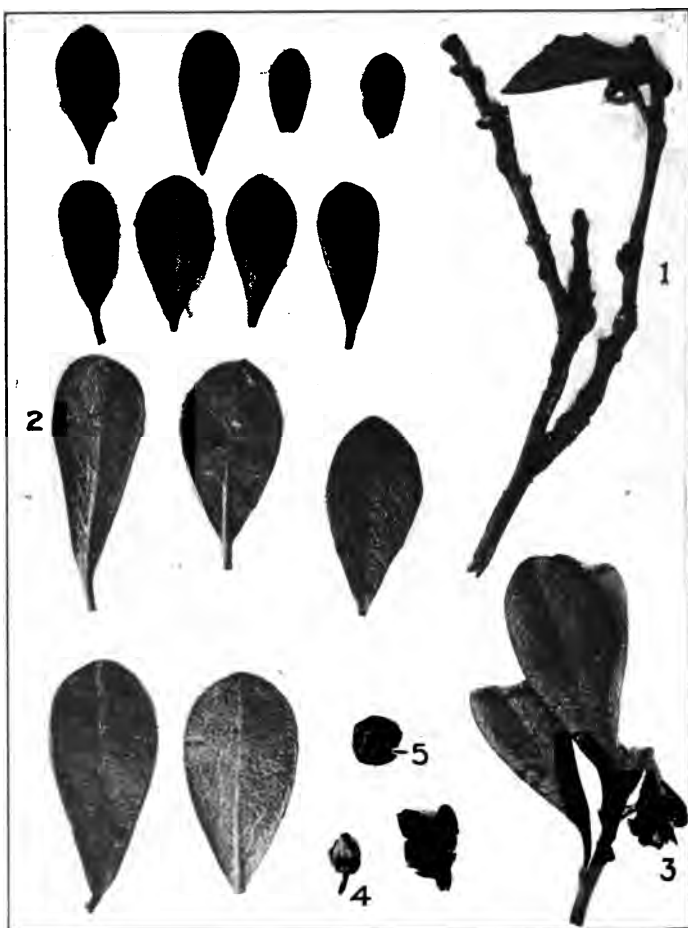
Boldo occurs as a mixture of entire and broken leaves. The *petiole* is stout, and it measures up to 6 mm. in length. The *blade* is rounded or subcordate at the base. The *margin* is entire and revolute. The *apex* is rounded or notched. The *outline* varies from ovate-oval to oblong-ovate. The *blade* measures up to 7.5 cm. in length and up to 5.2 cm. in width. The *upper surface* is coarsely papillose, and it varies in color from greenish yellow to grayish green, and the veins are deeply impressed. The *under surface* varies in color from grayish green to yellowish green, and the veins are reticulate and prominent. The *texture* is coriaceous. The *odor* is aromatic. The *taste* is pungent and it resembles oil of wormseed.

Constituents: Tannin, resinous compounds, volatile oil, alkaloid (boldine), etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Fluidextractum Boldi; Dose, 0.5 mil (8 min.).



UVA URSI

1, Branched stem. 2, Several leaves of variable outline and size. 3, Branch with leaves and flowers. 4, Single flower. 5, Fruit.

UVA URSI U. S. P.

English name: Uva Ursi.

Synonyms: Bearberry.

Botanical origin: *Arctostaphylos Uva-ursi* (Linné)
Sprengel. (Fam. *Ericaceæ*.)

Part used: Leaves.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: None given.

Ash: None given.

Habitat: Asia, Europe, North America south to Pennsylvania and California.

Description:

Uva ursi occurs as a mixture of entire and broken leaves. The *petioles* are thick and they measure up to 6 cm. in length. The *blade* is cuneate at the base. The *margin* is entire and revolute. The *apex* is rounded, obtuse or acute. The *outline* varies from spatulate to oblong-spatulate to obovate. The blade measures up to 30 mm. in length and to 15 mm. in width. The *upper surface* is smooth and shiny; it varies in color from yellowish green to grayish green; the veins are slightly impressed, and this gives the surface a reticulate appearance. The *under surface* is yellowish green and reticulate. The *texture* is coriaceous. The *odor* is not distinct. The *taste* is astringent.

Constituents: Glucosides (arbutin, ericolin), volatile oil, urson, fat, gum, coloring matter, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Uvæ Ursi; Dose, 2 mls (30 min.).



BUCHU—SHORT

1, Leaves and small stems. 2, Several leaves of variable size. 3, Top view of fruit with seeds removed. 4, Under view of fruit. 5, Seed. 6, Stems.

BUCHU U. S. P.

(1) Short Buchu

English name: Buchu.

Synonyms: Short Buchu.

Botanical origin: *Barosma betulina* (Thunberg) Bartling and Wendland. (Fam. *Rutaceæ*.)

Part used: Leaves.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 4 per cent.

Habitat: South Africa.

Description:

Short Buchu occurs as a mixture of broken and entire leaves, stems, and fruits, and occasionally flowers. The *petioles* are stout, and they measure 2 mm. or less in length. The *blade* is cuneate at the *base*. The *margin* is finely serrate, and at the base of each tooth there is an oil gland. The *apex* is obtuse or broadly acute, and it is bent back toward the under surface. The *outline* varies from obovate to oval to rotund-cuneate. The *blade* measures 26 mm. or less in length and 21 mm. or less in width. The *upper surface* is papillose and yellowish green in color; the veins are prominent. The *under surface* is papillose, wrinkled and pellucid-punctate; the color is yellowish green. The *texture* is coriaceous. The *odor* is aromatic and like mint. The *taste* is pungent.

Constituents: Gum, resin, volatile oil, mucilage, glucosides, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Elixir Buchu N. F.; Dose, 4 mls (1 fl. dr.).

Elixir Buchu Compositum N. F.; Dose, 4 mls (1 fl. dr.).

Elixir Buchu et Potassii Acetatis N. F.; Dose, 4 mls (1 fl. dr.).

Fluidextractum Buchu; Dose, 2 mls (30 min.).

Fluidextractum Buchu Compositum N. F.; Dose, 2 mls (30 min.).



BUCHU—LONG

1, Leaves and small stems. 2, Leaves of variable size. 3, Partially developed fruit. 4, Seed. 5, Stems. 6, Flower.

BUCHU U. S. P.

(2) Long Buchu

English name: Buchu.

Synonyms: Long Buchu.

Botanical origin: *Barosma serratifolia* (Curtis) Willdenow. (Fam. *Rutaceæ*.)

Part used: Leaves.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 4 per cent.

Habitat: South Africa.

Description:

Long Buchu occurs as a mixture of entire and broken pieces of the leaves and stems. The *petioles* are stout and they measure 2 cm. or less in length. The *blades* are tapering at the base. The *margin* is finely serrate and a gland occurs at the base of each tooth. The *apex* is truncate or obtuse and glandular. The *outline* varies from linear-lanceolate to oblong-linear-lanceolate. The *blades* measure 4 cm. or less in length and 10 mm. or less in width. The *upper surface* varies in color from dark green to yellowish green. The *under surface* is grayish green and pellucid-punctate; the midvein is prominent. The *texture* is brittle and coriaceous. The *odor* is aromatic and mint-like. The *taste* is pungent.

Constituents: Gum, resin, volatile oil, mucilage, glucosides, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Elixir Buchu N. F.; Dose, 4 mls (1 fl. dr.).

Elixir Buchu Compositum N. F.; Dose, 4 mls (1 fl. dr.).

Elixir Buchu et Potassii Acetatis N. F.; Dose, 4 mls (1 fl. dr.).

Fluidextractum Buchu; Dose, 2 mls (30 min.).

Fluidextractum Buchu Compositum N. F.; Dose, 2 mls (30 min.).



CHIMAPHILA

- 1, Stem with many leaves. 2, Three leaves of variable size.
3, Side and surface view of fruits.

CHIMAPHILA (Chimaph.) N. F.

English name: Chimaphila.

Synonyms: Prince's Pine, Pipsissewa.

Botanical origin: *Chimaphila umbellata* (Linné) Barton. (Fam. *Ericaceæ*.)

Part used: Leaves.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Europe, Asia, North America.

Description:

Chimaphila occurs as a mixture of entire and broken pieces of the leaves, stems, flowers and fruits. The *petioles* are thick, and they measure up to 7 mm. in length. The *blade* is cuneate at the base. The *margin* of the cuneate portion is entire, of the upper portion sharply serrate. The *teeth* are more prominent when viewed from the under surface. The *apex* is acute or obtuse. The *outline* varies from oblanceolate to obovate-cuneate. The *blade* measures up to 5.5 cm. in length and to 17 mm. in width. The *upper surface* is smooth, shiny and dark green; the veins are slightly impressed. The *under surface* is smooth, dull and yellowish green or gray green; the veins are prominent. The *texture* is coriaceous. The *odor* is not distinct. The *taste* is astringent.

Constituents: Crystalline principles (chimaphilin, arbutin, etc.), tannin, volatile oil, fat, resin, starch, gum, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Chimaphilæ; Dose, 2 mls (30 min.):



DAMIANA—TURNERA DIFFUSA

1, Stem with clusters of leaves. 2, Cluster of leaves. 3, Leaves of variable size. 4, Flower.

DAMIANA N. F.

(1) *Turnera Diffusa*

English name: Damiana.

Synonyms: *Turnera*.

Botanical origin: *Turnera diffusa* Willdenow. (Fam. *Turneraceæ*.)

Part used: Leaves.

Impurities: Not more than 10 per cent. of stems and other parts of the same plant or other foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Southern Texas, Lower California to South America.

Description:

Turnera diffusa occurs as broken or as cut pieces of the stems, leaves and flowers. The size is variable. The nodes are alternate. The internodes are of variable length. The texture is woody. The color varies from yellowish to grayish purple or brown. The surface is usually non-striated and the smallest and larger twigs are tomentose. The fracture is uneven. The cortex, wood and pith are not distinct. The leaves are nearly sessile. The blade is cuneate at the base. The margin is sharply serrate and the margin of the teeth is revolute. The apex is rounded. The outline varies from oblong-oval to spatulate. The leaf varies in size from 16 mm. or less in length to 7 mm. or less in width. The upper surface varies in color from yellow to grayish brown and it is tomentose. The veins are impressed and each branch of the midvein ends in a sinus. The under surface is light grayish yellow and tomentose. The midvein is elevated and two to three times as broad as in *Turnera aphrodisiaca*. The branches of the midvein are slightly elevated.

Constituents: Volatile oil, bitter principle (damianin), resin, tannin, sugar, gum, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Damianæ; Dose, 2 mls (30 min.).



DAMIANA—TURNERA APHRODISIACA

1, Leaves, stems and fruits. 2, Stem with clusters of leaves. 3, Leaves of variable size. 4, Fruit and seeds. 5, Flower.

DAMIANA N. F.

(2) *Turnera aphrodisiaca*

English name: Damiana.

Synonyms: *Turnera*.

Botanical origin: *Turnera aphrodisiaca* Ward. (Fam. *Turneraceæ*.)

Part used: Leaves.

Impurities: Not more than 10 per cent. of stems and other parts of the same plant or other foreign matter.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Southern Texas to Northern South America.

Description:

Turnera aphrodisiaca occurs as broken or as cut pieces of the stems, leaves and flowers. The size is variable. The nodes are alternate. The internodes are of variable length. The texture is woody. The color is reddish brown. The surface is striated, the smallest twigs are very hairy, while the larger twigs are nearly glabrous. The fracture is uneven. The cortex, wood and pith are not distinctive. The leaves are nearly sessile. The blade is cuneate at the base. The margin is sharply serrate and the margin of the teeth is revolute. The apex is acute. The outline varies from oblong-lanceolate to obovate. The leaf varies in size from 3 cm. or less in length to 8 mm. or less in width. The upper surface varies in color from gray to dark green. There are no characteristic markings and the surface is nearly glabrous. The veins are impressed. The midvein is sinuous and each branch of the midvein ends in a sinus. The under surface is lighter than the upper surface and it is slightly glandular. The midvein is strongly elevated while the branches are less so. The flowers are seldom present. The fruit consists of a three-parted capsule. The capsules frequently contain many yellow crescent-shaped seeds constricted at one end. The surface of the seeds is ribbed, and between the ribs the surface is reticulate. The odor is aromatic, and resembles the odor of strawberries. The taste is pungent.

Constituents: Volatile oil, bitter principle (damianin), resin, tannin, sugar, gum, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Damianæ: Dose, 2 mls (30 min.).



CASTANEA

1, Stem and folded leaf. 2, Base of leaf. 3, Flower cluster. 4, Coarsely serrate margin of the leaf.

CASTANEA (Castan.) N. F.

English name: Castanea.

Synonyms: Chestnut Leaves.

Botanical origin: *Castanea dentata* (Marshall) Borkhausen. (Fam. *Fagaceæ*.)

Part used: Leaves.

Impurities: Not more than 5 per cent. of twigs or other foreign matter.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Maine to Michigan, south to Georgia and Alabama.

Description:

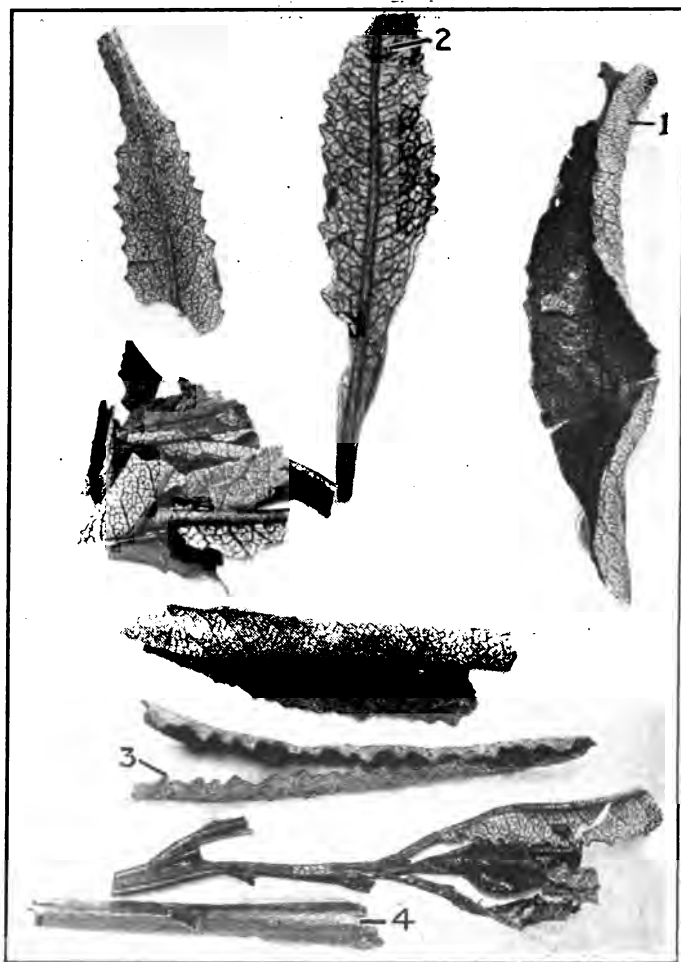
Castanea occurs as a mixture of entire and broken pieces. The *petioles* measure up to 10 cm. in length. The *blade* is tapering and slightly rounded at the *base*. The *margin* is coarsely serrate. The *apex* is acuminate. The *outline* varies from oblong-lanceolate to elliptic-lanceolate. The *leaves* measure up to 34 cm. in length and the blade to 11 cm. in width. The *upper surface* is smooth, and the color varies from dark green to yellowish green. The *under surface* is grayish green. The veins are pinnate and each large branch of the midvein ends in a tooth. The *texture* is coriaceous. The *stems* are simple and of variable size. The *surface* is striated. The *nodes* are distinct. The *leaves* are alternate. The *texture* is fibrous. The *color* is dark green. The *surface* is striated. The *fracture* is woody. The *outline* is cylindrical. The *cortex* is thin. The *wood* is thick and radiate. The *odor* of chestnut is not distinct. The *taste* is astringent.

Constituents: Tannin, fat, gum, resin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Castanæ; Dose, 4 mls (1 fl. dr.)



ERIODICTYON

- 1, Leaf with involute margins. 2, Under surface of the leaf.
3, Serrate margin. 4, Stems.

ERIODICTYON (Eriodict.) U. S. P.

English name: Eriodictyon.

Synonyms: Yerba Santa, Consumptive's Weed, Mountain Balm.

Botanical origin: *Eriodictyon californicum* (Hooker and Arnott) Greene. (Fam. *Hydrophyllaceæ*.)

Part used: Leaves.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: None given.

Ash: None given.

Habitat: California, south to Mexico.

Description:

Eriodictyon occurs as broken pieces of the leaves and stems. The *petioles* are stout, purplish brown and channeled; they measure 7 mm. or less in length. The *blade* is involute and tapering at the *base*. The *margin* is unequally serrate and involute, and the edges frequently touch. The *apex* is acute. The *outline* varies from lanceolate to oblong-lanceolate. The *blades* measure 11 cm. or less in length and 25 mm. or less in diameter. The *upper surface* is yellowish brown in color and covered with a coat of shiny resin; the veins are slightly impressed. The *under surface* varies in color from yellowish white to greenish yellow; the veins are prominent. The *surface* between the veins is tomentose. The texture is coriaceous, easily broken. The *odor* is aromatic. The *taste* is pungent, bitter and sweet.

Constituents: Volatile oil, glucose, resin, acid, etc.

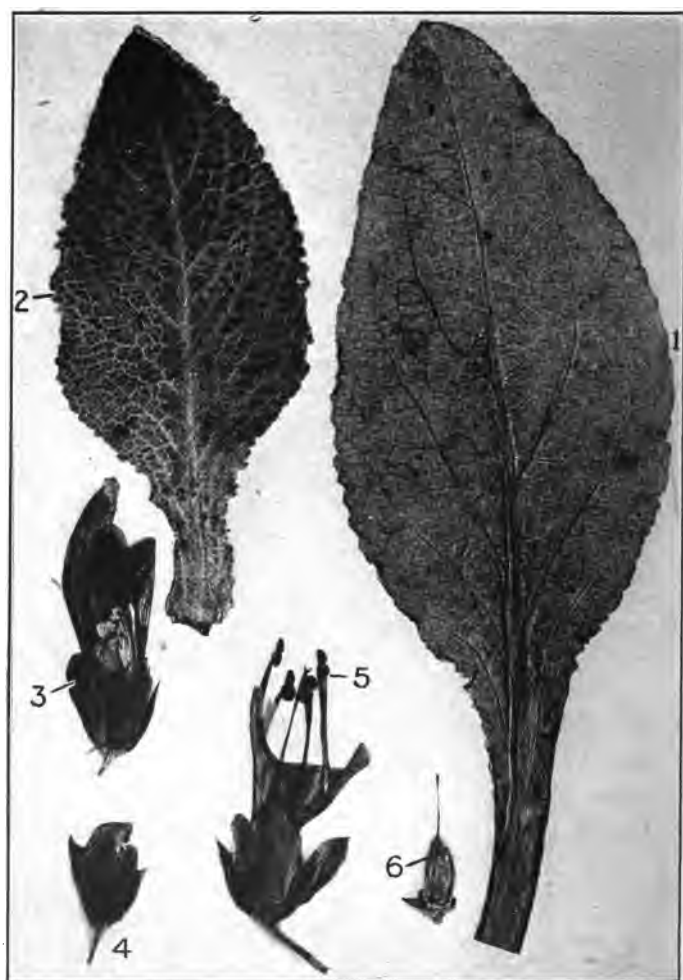
Dose: 1 Gm. (15 grains).

Preparations:

Elixir Eriodictyi Aromaticum N. F.; Dose, 4 mils (1 fl. dr.).

Fluidextractum Eriodictyi; Dose, 1 mil (15 min.).

Syrupus Eriodictyi Aromaticus N. F.; Dose, 8 mils (2 fl. drs.).



DIGITALIS

1, Under surface of the leaf. 2, Upper surface of the leaf.
 3, Flower showing stamens. 4, Flower bud. 5, Five
 stamens and the pistil. 6, Developing ovary.

DIGITALIS (Digit.) U. S. P.

English name: Digitalis.

Synonyms: Foxglove, *Digitalis folium* P. I.

Botanical origin: *Digitalis purpurea* Linné. (Fam. *Scrophulariaceæ*.)

Part used: Leaves.

Impurities: Not more than 2 per cent. of stems, flowers or other foreign matter.

Assay: B.A.—Minimum lethal dose should not be greater than 0.006 mil of tincture for each Gm. of frog.

Ash: Not more than 15 per cent.

Habitat: Europe; naturalized in Oregon, Washington and elsewhere.

Description:

Digitalis occurs as a mixture of broken and entire pieces of the leaves, stems and flowers. The *petioles* are winged and measure up to 3 cm. in width; the upper leaves are sessile. The *blade* is tapering abruptly at the *base* into the petiole. The *margin* is dentate. The *apex* is acute. The *outline* varies from ovate to ovate-lanceolate. The leaves measure up to 3 dm. in length, the blade to 11.5 cm. in width. The *upper surface* is dark green, slightly hairy, and the veins are reticulate and distinctly hairy. The *under surface* is grayish green, pubescent, and the veins are hairy, elevated and brown. The *texture* is papery. The *odor* is slight. The *taste* is strongly bitter.

Constituents: Glucosides (digitoxin and digitalin, digitonin, etc.), oil, starch, sugar, resin, pectin, acids, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

Fluidextractum Digitalis; Dose, 0.05 mil (1 min.).

Infusum Digitalis; Dose, 4 mils (1 fl. dr.).

Pilule Digitalis, Scillæ et Hydrargyri N. F.; Dose, 1 pill.

Tinctura Digitalis; Dose, 0.5 mil (8 min.).



HAMAMELIDIS FOLIA

1, Under surface of the leaf. 2, Upper surface of the leaf. 3, Longitudinal section of the fruit. 4, Stem. 5, Flowers.

HAMAMELIDIS FOLIA (Hamamel. Fol.) N. F.

English name: Hamamelis Leaves.

Synonyms: Witch Hazel Leaves.

Botanical origin: *Hamamelis virginiana* Linné. (Fam. *Hamamelidaceæ*.)

Part used: Leaves.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: New Brunswick to Nebraska, south to Florida and Texas.

Description:

Hamamelis Leaves occur as a mixture of entire and broken flat or folded leaves. The *petioles* measure up to 9 mm. in length. The *base* is inequilateral, one side tapering, the other rounded, less frequently cordate. The *margin* is crenate, or the lower portion is entire. The *apex* is rounded, acute, or acuminate. The *outline* varies from orbicular-oval to obovate. The *leaves* measure up to 14 cm. in length and the blade up to 10.5 cm. in width. The *upper surface* is dull dark green, and the veins are distinct. The *under surface* is shiny, and yellowish or grayish or pinkish green, and the veins are prominent. The *texture* is coriaceous. Stems, flowers and fruits are sometimes present. The *stems* are woody, branched and light green. The *flowers* have a *calyx* of four reflexed sepals, a *corolla* of four ligulate yellow petals, an *androeceum* of four stamens, a *gynoeceum* of one pistil, with two one-celled carpels united at the base, and a two-parted *style*. The *fruit* is a beaked two-celled capsule, each cell with a hard, shiny seed. The *odor* is not distinct. The *taste* is astringent.

Constituents: Tannin, bitter principle, volatile oil, etc.

Dosé: 2 Gm. (30 grains).

Preparations:

Fluidextractum Hamamelidis Foliorum; Dose, 2 mls (30 min.).



MALVÆ FOLIA—LOW MALLOW

1, Under surface of the leaf showing the lobed and crenate-dentate margin. 2, Sinus of a lobe. 3, The brown fungus growths of *Puccinia malvacearum*. 4, Petal. 5, Sepal. 6, Fruit and persistent calyx.

MALVÆ FOLIA (Malv. Fol.) N. F.

(1) Low Mallow

English name: Mallow Leaves.

Synonyms: Low Mallow, Cheeses.

Botanical origin: *Malva rotundifolia* Linné. (Fam. *Malvaceæ*.)

Part used: Leaves.

Impurities: Reject leaves showing brown fungous growths of *Puccinia Malvacearum* Montagne.

Assay: None given.

Ash: Not less than 16 per cent.

Habitat: Europe and Asia; naturalized in North America.

Description:

Low Mallow occurs as a mixture of entire and broken pieces of the leaves, flowers and fruits. The *petiole* is hairy and measures 9 cm. or less in length and 2 mm. or less in width. The *blade* is cordate at the *base*. The *margin* has as many as nine lobes, and it is crenate-dentate. The *apex* of each lobe ends in a broad tooth. The *outline* varies from orbicular to reniform. The *blade* measures 6 cm. or less in length and 9 cm. or less in width. The *upper surface* varies in color from dark green to yellowish green; the veins are indistinct. The *under surface* is light green or yellowish green; the veins are palmate and elevated. The *texture* is papery. The *odor* is not distinct. The *taste* is mucilaginous.

Constituents: Pectin, tannin, coloring matter, etc.

• **Dose:** None given.

Preparations:

None.



MALVÆ FOLIA—HIGH MALLOW

1, Under surface of the lobed and palmately veined leaf. 2, Sinus. 3, Several flower buds. 4, Fruit and persistent calyx. 5, Petal. 6, Outer surface of the persistent calyx.

MALVÆ FOLIA (Malv. Fol.) N. F.

(2) High Mallow

English name: Mallow Leaves.

Synonyms: High Mallow.

Botanical origin: *Malva sylvestris* Linné. (Fam. *Malvaceæ*.)

Part used: Leaves.

Impurities: Reject leaves showing brown fungous growths of *Puccinia Malvacearum* Montagne.

Assay: None given.

Ash: Not more than 16 per cent.

Habitat: Europe; naturalized in North America, British America to Mexico.

Description:

High Mallow occurs as a mixture of entire and broken leaves, flowers and fruits. The *petioles* of the leaves measure 8 cm. or less in length. The *blade* is cordate at the base. The *margin* is three- to seven-lobed and crenate-dentate. The *apex* of each lobe ends in a large tooth. The *outline* varies from reniform to orbicular. The *blade* measures 11 cm. or less in length and 12 cm. or less in width. The *upper surface* is slightly hairy and varies in color from dark green to yellowish green; the veins are palmate, distinct, and slightly elevated. The *under surface* is pubescent and yellowish or brownish green in color; the veins are elevated. The *texture* is herbaceous. The *odor* is not distinct. The *taste* is mucilaginous.

Constituents: Pectin, tannin, coloring matter, etc.

Dose: None given.

Preparations:

None.



ALTHÆÆ FOLIA

1, Mass of folded wrinkled leaves. 2, Entire leaf showing the lobed and doubly serrate margin. 3, Under surface of a smaller leaf. 4, Flower buds.

ALTHÆÆ FOLIA (Althæ. Fol.) N. F.

English name: Althæa Leaves.

Synonyms: Marsh Mallow Leaves, White Mallow.

Botanical origin: *Althæa officinalis* Linné. (Fam. *Malvaceæ*.)

Part used: Leaves.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 16 per cent.

Habitat: Europe and Asia; naturalized in salt marshes from Massachusetts to New Jersey.

Description:

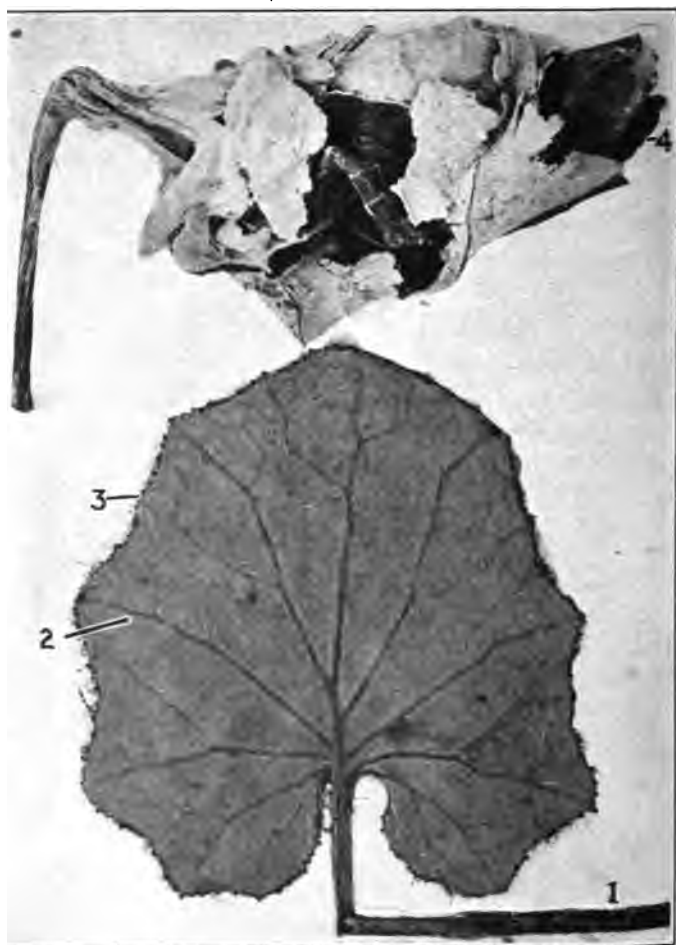
Marsh Mallow Leaves occur as a mixture of entire and broken pieces of the leaves, stems and flowers. The *petioles* are stout and they measure 15 mm. or less in length. The *blade* is rounded or subcordate at the *base*. The *margin* is lobed and doubly serrate-dentate. The *apex* is acute. The *outline* varies from ovate-lanceolate to broadly ovate. The *blades* measure 12 cm. or less in length and 10 cm. or less in width. The *upper surface* is yellowish gray and pubescent; the veins are slightly impressed. The *under surface* is yellowish gray and pubescent; the principal veins are elevated. The *texture* is hairy. The *odor* is not distinct. The *taste* is slightly mucilaginous.

Constituents: Mucilage, asparagin, sugar, starch, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Enters into *Species Emollientes*.



FARFARA

1, Portion of the petiole. 2, Under surface showing the prominent veins and slight lobes. 3, Small reddish brown teeth. 4, A folded and broken leaf.

FARFARA (Farfar.) N. F.

English name: Coltsfoot.

Synonyms: Coltsfoot Leaves, Tussilago Leaves.

Botanical origin: *Tussilago Farfara* Linné. (Fam. *Compositæ*.)

Part used: Leaves.

Impurities: Not more than 5 per cent. of other parts of the plant or other foreign matter.

Assay: None given.

Ash: Not more than 20 per cent.

Habitat: Europe and Northern Asia; naturalized in Nova Scotia, south to New York and Minnesota.

Description:

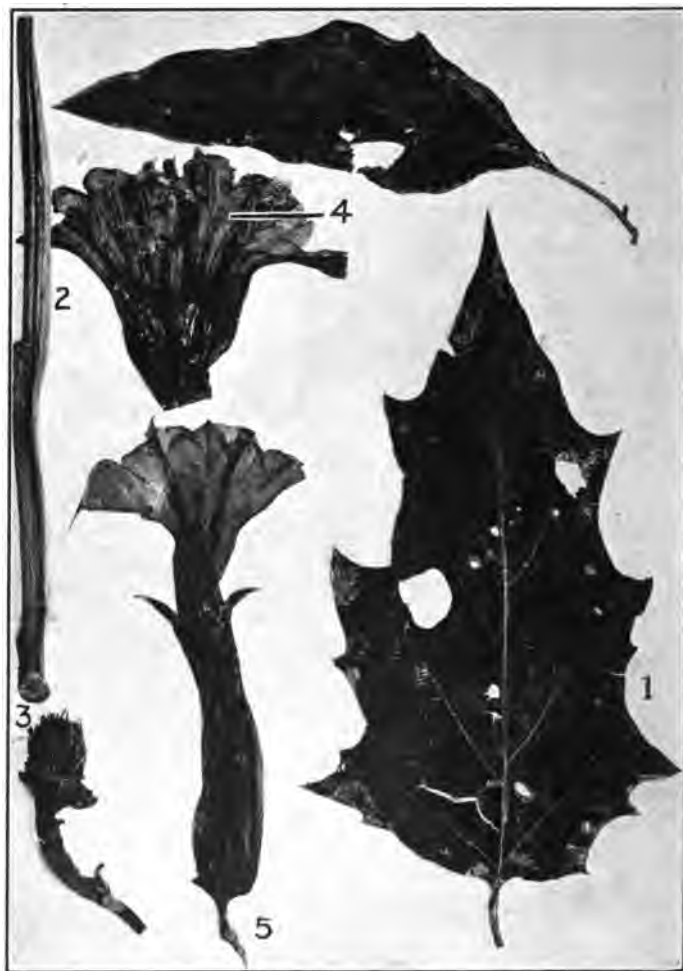
Coltsfoot occurs as a mixture of entire, broken and folded leaves. The *petiole* is pubescent, channeled, and up to 36 cm. in length. The *blade* is cordate at the *base*; the *margin* is angulately lobed and dentate; the *teeth* are reddish brown. The *apex* is blunt. The *outline* varies from orbicular to broadly reniform. The *blade* measures up to 19 cm. in length and to 20 cm. in diameter. The *upper surface* is dull; the *color* varies from dark green to yellowish green, and the veins are not distinct. The *under surface* is white, tomentose, and has up to ten palmate veins of a yellowish brown or purplish brown color. The *odor* is not distinct. The *taste* is bitter.

Constituents: Bitter principle, glucoside, tannin, resin, saponin, volatile oil, wax, caoutchouc, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

None.



STRAMONIUM

1, Laciniately lobed and toothed margin. 2, Fragment of stem. 3, Spiny fruit. 4, Flower split to show the five stamens. 5, Solitary flower.

STRAMONIUM (Stramon.) U. S. P.

English name: Stramonium.

Synonyms: Jimson Weed, Thorn Apple Leaves.

Botanical origin: *Datura Stramonium* Linné or *Datura Tatula* Linné. (Fam. *Solanaceæ*.)

Part used: Leaves.

Impurities: Not more than 10 per cent. of stems or other foreign matter.

Assay: Not less than 0.25 per cent. of total alkaloids.

Ash: Not more than 20 per cent.

Habitat: Asia; naturalized in North America.

Description:

Stramonium occurs as a mixture of entire and broken leaves, stems, flowers and fruits. The *petioles* measure up to 2 cm. in length. The *blade* is rounded, truncate, or tapering, and inequilateral at the *base*. The *margin* is lacinately lobed and toothed. The *apex* is acute. The *outline* varies from ovate to lanceolate. The *blade* measures up to 30 cm. in length and to 20 cm. in width. The *upper surface* is dark green and smooth, and the veins are distinct. The *under surface* varies from light green to yellowish green, and the veins are elevated, brown and hairy. The *texture* is papery. The *odor* is narcotic. The *taste* is salty and bitter.

Constituents: Potassium nitrate, fixed oil, gum, chlorophyl, alkaloids (hyoscyamine, atropine), resin, proteids, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

- Extractum Stramonii (pilular); Dose, 0.01 Gm. ($\frac{1}{6}$ grain).
- Extractum Stramonii (powdered); Dose, 0.01 Gm. ($\frac{1}{6}$ grain).
- Tinctura Stramonii; Dose, 0.5 mil (8 min.).
- Unguentum Stramonii (from extract).



MENYANTHES

1, Trifoliate leaf. 2, Entire margin of the leaflet. 3, Cluster of flowers. 4, Single flower.

MENYANTHES (Menyanth.) N. F.

English name: Menyanthes.

Synonyms: Bogbean, Buckbean, Marsh Trefoil.

Botanical origin: *Menyanthes trifoliata* Linné. (Fam. *Gentianaceæ*.)

Part used: Leaves.

Impurities: None given officially.

Assay: None given.

Ash: Not less than 10 per cent.

Habitat: Europe and Asia; North America, south to Pennsylvania and California.

Description:

Menyanthes occurs as a mixture of entire and broken leaves. The leaves are trifoliolate. The *petioles* are broad, flat and striated, and they measure up to 17 cm. in length. The *leaflets* have short petioles or are sessile. The *blades* are cuneate at the base. The *margin* is entire. The *apex* is obtuse or acute. The *outline* is obovate. The leaflets measure up to 8 cm. in length and to 4 cm. in width. The *upper surface* varies in color from yellowish to brownish green, and the veins are yellowish and elevated. The *odor* is not distinct. The *taste* is strongly bitter.

Constituents: Menyanthin (glucoside) and meliatin.
Not fully investigated.

Dose: 1 Gm. (15 grains).

Preparations:

None.



PILOCARPUS—LARGE-LEAVED

1, Upper surface of the leaf showing the large and small veins parallel to the margin. 2, Under surface of the leaf with elevated central vein and emarginate apex. 3, Small leaf. 4, Portions of stem.

PILOCARPUS (Pilocarp.) U. S. P.

(1) Large-leaved Pilocarpus

English name: Pilocarpus.

Synonyms: Large-leaved Jaborandi, Pernambuco Jaborandi.

Botanical origin: *Pilocarpus Jaborandi* Holmes.
(Fam. *Rutaceæ*.)

Part used: Leaflets.

Impurities: Not more than 5 per cent. of stalks bearing the leaflets and stems of the same plant, or other foreign matter.

Assay: Not less than 0.6 per cent. of alkaloids.

Ash: Not more than 7 per cent.

Habitat: Brazil.

Description:

Large-leaved *Pilocarpus* occurs as a mixture of entire and broken pieces of the leaflets, stalks and stems. The leaves are compound. The petiolules of the leaflets are stout and they measure up to 8 mm. in length. The blades are inequilateral, tapering and rounded or acute at the base. The margin is entire and slightly revolute. The apex is slightly tapering and emarginate. The outline varies from oblong to oblong-oval. The blade has a maximum length of 15 cm. and a width of 4.5 cm. The upper surface is yellowish green, smooth, and the veins are elevated. The branches of the midvein meet to form a large inner and a small outer wavy vein, which runs parallel to the margin. The under surface is yellowish green, dull; the midvein is large and elevated and its branches are elevated. The odor is slight. The taste is salty and bitter.

Constituents: Alkaloids (pilocarpine, etc.), volatile oil, resin, tannin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Pilocarpi; Dose, 2 mils (30 min.).



PILOCARPUS—SMALL-LEAVED

1. Part of a compound leaf with four leaflets. 2. Leaves of variable form and size. 3. Two fruits. 4. Portion of stem.

PILOCARPUS (Pilocarp.) U. S. P.

(2) Small-leaved Pilocarpus

English name: Pilocarpus.

Synonyms: Small-leaved Jaborandi, Maranham, Jaborandi.

Botanical origin: *Pilocarpus microphyllus* Stapf.
(Fam. Rutaceæ.)

Part used: Leaflets.

Impurities: Not more than 5 per cent. of stalks bearing the leaflets and stems of the same plant or other matter.

Assay: Not less than 0.6 per cent. of alkaloids.

Ash: Not more than 7 per cent.

Habitat: Brazil.

Description:

Small-leaved Pilocarpus occurs as a mixture of entire and broken pieces of the leaflets. The *petiolules* of the terminal leaflet are margined and they measure up to 5.5 cm. in length. The lateral leaflets are sessile. The *blade* of the terminal leaflet is equilateral, rounded and tapering into the petiolule; the base of the lateral leaflets is inequilateral, tapering and rounded. The *margin* is entire and slightly revolute. The *apex* is tapering and emarginate. The *outline* varies from obovate to oval. The *leaflets* measure up to 5 cm. in length and to 2.2 cm. in width. The *upper surface* varies in color from grayish to yellowish green, and the veins are not elevated. The *under surface* is grayish or yellowish green, dull, and the veins are elevated. The *texture* is coriaceous. The *odor* is slight. The *taste* is salty and bitter.

Constituents: Alkaloids (pilocarpine, etc.), volatile oil, resin, tannin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Pilocarpi; Dose, 2 mls (30 min.).



SENNA—INDIA

1, Three leaflets. 2, Compound leaf with six leaflets. 3, Five leaves of variable size and shape. 4, Fruit (pod). 5, Flower and two flower buds.

SENNA (Senn.) U. S. P.

(1) India Senna

English name: Senna.

Synonyms: India Senna, Tinnevely Senna.

Botanical origin: *Cassia angustifolia* Vahl. (Fam. *Leguminosæ*.)

Part used: Leaflets.

Impurities: Not more than 10 per cent. of stem tissues, pods, seeds and other impurities.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: East and Central Africa and India.

Description:

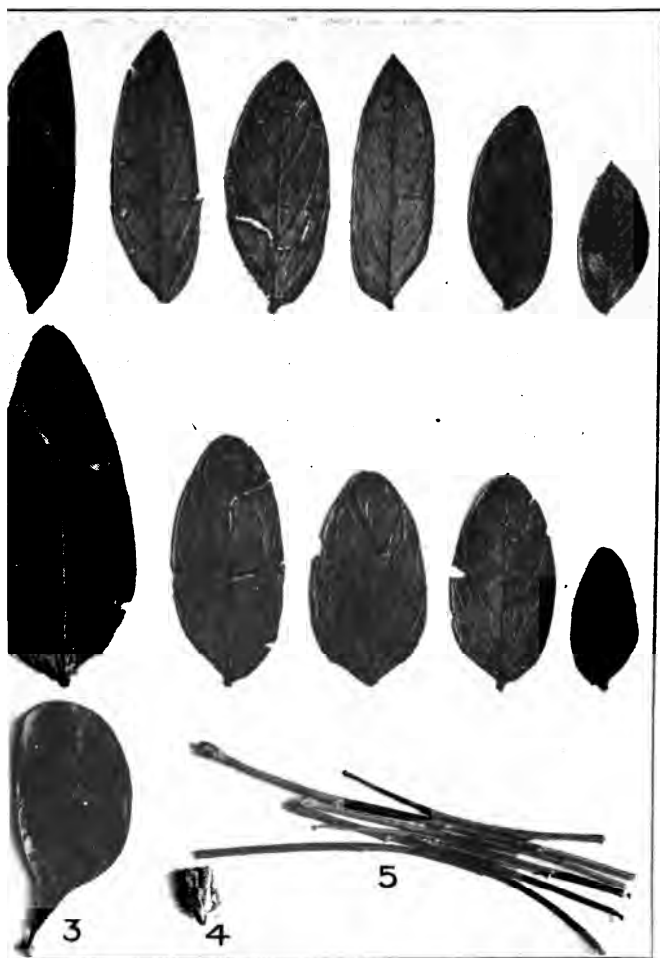
India senna occurs as a mixture of entire with a few broken leaves. The leaves are even pinnately compound. The leaflets are usually separated from the stalks. The petioles measure 2 mm. or less in length. The blade is inequilateral at the base. The margin is entire. The apex is acuminate, acute and mucronate. The outline varies from linear-lanceolate to oblong-lanceolate. The blades measure 5.5 cm. or less in length and 16 mm. or less in width. These leaflets are uniformly longer in proportion to their width than the leaflets of *Alexandria senna*. The upper surface is smooth and varies in color from dark to yellowish green; the veins are slightly elevated. The under surface is slightly hairy and light yellowish green in color; the veins are elevated. The texture is subcoriaceous. The odor is slight. The taste is bitter and mucilaginous.

Constituents: Cathartic acid, glucosides, gum, resin, sugar, bitter principle, volatile oil, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Confectio Sennæ N. F.; Dose, 4 Gm. (1 drachm).
Fluidextractum Sennæ; Dose, 2 mls (30 min.).
Infusum Sennæ Compositum; Dose, 120 mls (4 fl. ozs.).
Pulvis Glycyrrhizæ Compositus; Dose, 4 Gm. (1 drachm).
Species Laxativæ N. F.; Dose, 1.3 Gm. (20 grains).
Syrupus Ficorum Compositus N. F.; Dose, 4 mls (1 fl. dr.)
Syrupus Sennæ (from fluidextract); Dose, 4 mls (1 fl. dr.).
Syrupus Sennæ Aromaticus N. F.; Dose, 8 mls (2 fl. drs.).
Syrupus Sennæ Compositus N. F.; Dose, 8 mls (2 fl. drs.).



SENNA—ALEXANDRIA

1, Six leaflets of variable size and form. 2, Typical Alexandria senna leaves. 3, Fruit (pod). 4, Seed. 5, Stems.

SENNA (Senn.) U. S. P.

(2) Alexandria Senna

English name: Senna.

Synonyms: Alexandria Senna.

Botanical origin: *Cassia acutifolia* Delile. (Fam. *Leguminosæ*.)

Part used: Leaflets.

Impurities: Not more than 10 per cent. of stem tissues, pods, seeds, and other matter.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Central Africa.

Description:

Alexandria Senna occurs as a mixture of entire and broken pieces of leaflets, stalks and fruits. The leaflets are usually separated from the stalks. The petioles measure 1 mm. or less in length. The blade of the leaflet is inequilateral, rounded on one side, acute on the other. The margin is entire. The apex is acute and mucronate. The outline varies from ovate-lanceolate to oblong-lanceolate. The blade measures 4.2 cm. or less in length and 17 mm. or less in diameter. The upper surface is nearly smooth and varies in color from dark to light green; the veins are slightly elevated. The under surface is hairy and grayish green in color; the veins are elevated. The texture is coriaceous. The odor is slight. The taste is bitter and mucilaginous.

Constituents: Cathartic acid, glucosides, gum, resin, sugar, bitter principle, volatile oil, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Confectio Sennæ N. F.; Dose, 4 Gm. (1 drachm).

Fluidextractum Sennæ; Dose, 2 mls (30 min.).

Infusum Sennæ Compositum; Dose, 120 mls (4 fl. ozs.).

Pulvis Glycyrrhizæ Compositus; Dose, 4 Gm. (1 drachm).

Species Laxativæ N. F.; Dose, 1.5 Gm. (20 grains).

Syrupus Ficorum Compositus N. F.; Dose, 4 mls (1 fl. dr.).

Syrupus Sennæ (from fluidextract); Dose, 4 mls (1 fl. dr.).

Syrupus Sennæ Aromaticus N. F.; Dose, 8 mls (2 fl. drs.).

Syrupus Sennæ Compositus N. F.; Dose, 8 mls (2 fl. drs.).

CHAPTER XII

FLOWERS

THE medicinal flowers are grouped into two classes :
(1) Simple Flowers and (2) Flower Heads.

SIMPLE FLOWERS

When studying simple flowers, there must be considered the following: Type, peduncle, pedicel, calyx, corolla, androecium, gynæcium, fruit, color of mass, odor and taste.

1. **Type.** Convallaria flowers occur in a scorpioid raceme; brayera in compound panicles; the other official flowers usually occur solitary.

2. **Peduncles.** The peduncle is the stem of the inflorescence. The peduncle of convallaria flowers is simple, smooth and curved. In brayera the peduncles are branched and hairy, and each branch is subtended by a leaf with large bracts or the smallest branch by bracts.

3. **Pedicels.** The pedicel is the stem of the individual flowers. The pedicels of convallaria flowers are subtended by a small bract and they are smooth and slender; in arnica flowers they are very minute. Commercial mullein flowers have no pedicels, because the pedicel, calyx and pistil remain attached to the plant when the flowers are collected.

4. **Calyx.** The calyx is the outer set of floral leaves. In cloves the calyx is united below and expanded above into four lobes. No calyx is present in mullein flowers. In sambucus the calyx is united below, free above and with five teeth. In brayera the calyx is united below and free above; it has five lobes.

5. **Corolla.** The corolla is the inner of two sets of floral leaves. Clove has four brown imbricated petals

covering the stamens and pistils. The corolla of mullein flowers is united below, and the free portions are lobed and yellow. Lily-of-the-valley flowers are united and form a bell-shaped (campanulate) corolla; the free portion forms five lobes, which recurve. Elder flower corolla is united below to form a wheel-shaped (rotate) corolla; the free portion forms five lobes of a greenish yellow color. Brayera corolla is usually not present in the drug. Red rose consists almost wholly of imbricated (overlapping) petals.

6. **Andrœcium.** The andrœcium consists of stamens or male reproductive organs of the flower. In clove the stamens are numerous, and are enclosed by the imbricated petals. In mullein flowers there are five stamens, three long and two short; all five are covered with hairs. In convallaria there are six stamens inserted on the perianth; in elder flowers there are six stamens; in brayera the pistillate flowers are official, so no stamens are present. Red rose usually has numerous stamens among the petals forming the central part of the cone.

7. **Gynœcium.** The gynœcium consists of one or more separate pistils, or of a pistil composed of united carpels. In clove the pistil consists of a two-celled ovary and one persistent style. No pistils are present in mullein flowers; in convallaria and elder flowers the pistil has a three-celled ovary and a three-parted style; crocus consists of yellow style tissue; corn silk consists of fresh stigmas.

8. **Fruits.** Fruits are rarely present in a fully developed condition in any of the flowers; therefore they are not diagnostic.

9. **Color.** The color of the mass of flowers differs with each drug. Clove is dark brown; mullein is yellow; convallaria flowers are yellowish brown; sambucus is greenish yellow; brayera is reddish brown; red rose is purplish red; saffron is dark red; fresh corn silk varies from green to dark brown.

10. **Odor.** Clove, red rose, rosa gallica and crocus

have an aromatic odor; mullein, elder, brayera, and corn silk have no characteristic odor.

11. **Taste.** The taste of clove and of saffron is strongly pungent; that of elder flowers and red rose is bitter.

FLOWER HEADS

Flower heads are composed of a great number of flowers arranged in such a manner that they appear as a single flower. In the study of flower heads the following must be considered: Occurrence, peduncle, involucre, ray flowers, disk flowers, receptacle, color of mass, odor and taste.

1. **Occurrence.** Most flower heads occur in a broken condition, but occasionally they are entire, as in trifolium.

2. **Peduncle.** The peduncle is the stem upon which all the flowers are borne. In arnica, and occasionally in calendula, the peduncle is hairy and long; in matricaria the peduncles are furrowed.

3. **Involucre.** The involucre is made up of one or more circles of bracts or modified leaves. In arnica and calendula the involucre consists of two rows (series) of bracts; in matricaria it is frequently in three series. In clover the flower head is composed of simple flowers, each similar in structure.

4. **Ray Flowers.** The ray flowers are the outer circle of ligulate (strap-shaped) and usually pistillate flowers. In arnica and calendula they are yellow; in matricaria they are nearly white. In all the flowers the veins are prominent and the apex is toothed. Calendula consists almost wholly of ray flowers.

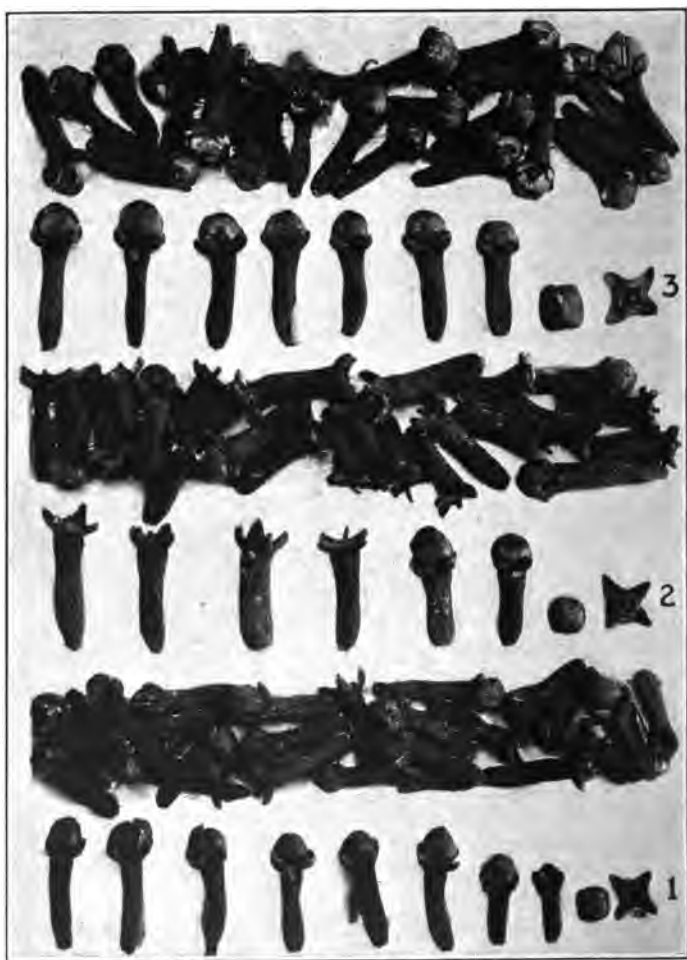
5. **Disk Flowers.** Disk flowers are the perfect flowers such as make up the greater part of arnica (refer to description under arnica) and matricaria. Very few disk flowers are present in calendula.

6. **Receptacle.** The receptacle is that part of the flower head which bears all the flowers. In arnica the receptacle is convex, pitted and hairy. In matricaria it is greatly elongated, pitted and free from hairs.

7. Color. The color must always be considered when studying flowers. In calendula, for example, the flowers are used largely for the yellow coloring substance found in them. If they are not kept in a dry place, or if kept for a long period, they lose their color and consequently their value as a coloring agent.

8. Odor. Arnica and matricaria have an aromatic odor; calendula and trifolium have no characteristic odor.

9. Taste. The taste of most of the flowers is bitter; that of arnica and matricaria is pungent; while that of calendula is slightly salty.



CARYOPHYLLUS

1, Zanzibar cloves. 2, Amboyna cloves. 3, Penang cloves.

CARYOPHYLLUS (Caryoph.) U. S. P.

English name: Clove.

Synonyms: None in common use.

Botanical origin: *Eugenia aromatica* (Linné) O. Kuntze; *Jambosa Caryophyllus* (Sprengel) Niedenzu. (Fam. *Myrtaceæ*.)

Part used: Flower buds.

Impurities: Not more than 5 per cent. of the peduncles, stems or other foreign matter.

Assay: None given.

Ash: Not more than 8 per cent. The amount of ash insoluble in hydrochloric acid is not more than 0.5 per cent. of the weight of clove taken.

Habitat: Cultivated in West Indies, South America and Africa.

Description:

Clove occurs as a mixture of entire flower buds of variable size. The *calyx* is tubular, compressed, two-sided and tapering below and four-sided above, and it terminates in four calyx teeth. These teeth curve upward and inward (involute) and are sharp-pointed. The maximum length is 18 mm. The color of the calyx varies from nearly black to reddish brown and the surface appears granular. The *corolla* consists of four imbricated yellowish or reddish brown petals of a globular or conical form. The *androe-cium* consists of numerous reddish brown stamens which are covered by the petals. The *gynæcium* consists of one pistil with a two-celled ovary and one stout, persistent style. The *odor* is strongly aromatic. The *taste* is strongly pungent. The three commercial varieties of cloves are Zanzibar, Amboyna and Penang. The Zanzibar cloves are the smallest, darkest variety. The Amboyna cloves are larger and lighter in color, and many of the petals and stamens are not present. Penang cloves are the largest, and they are light reddish brown in color. All the varieties should yield oil to a groove caused by a scratch or cut.

Constituents: Volatile oil, eugenol, gum, resin, tannin, etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

Oleum Caryophylli; Dose, 0.2 mil (3 min.).

Pulvis Aromaticus Rubefaciens N. F. (for external use).



VERBASCI FLORES

- 1, Mass of flowers. 2, Flower showing the hairy stamens.
3, Small flower. 4, Under surface of the flower.

VERBASCI FLORES (Verbasc. Flor.) N. F.

English name: Mullein Flowers.

Synonyms: Mullen Flowers.

Botanical origin: *Verbascum phlomoides* Linné or *Verbascum thapsiforme* Schraeder. (Fam. Scrophulariaceæ.)

Part used: Corollas with adhering stamens.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Europe and Asia; naturalized in Massachusetts.

Description:

Mullein Flowers occur in an entire condition, and they consist only of the corolla and the stamens. The corolla consists of five petals united below into a narrow tube and expanded above into a saucer-shaped part. The free ends are lobed. The lobes are rounded and usually unequal in length. The andræcium consists of five stamens adnate (attached) to the base of the corolla. Three of the stamens are shorter than the other two. All the stamens have a great number of white hairs; this gives them a woolly appearance. The odor is not distinct. The taste is slightly mucilaginous.

Constituents: Fixed and volatile oils, sugar, resin, wax, tannin, coloring matter, etc.

Dose: 8 Gm. (2 drachms).

Preparations:

None.



CONVALLARIÆ FLORES

- 1, Flowers and stems. 2, One-sided raceme of flowers.
3, Five stamens of the flower.

CONVALLARIÆ FLORES (Convallar. Flor.) N. F.

English name: Convallaria Flowers.

Synonyms: Lily-of-the-Valley Flowers.

Botanical origin: *Convallaria majalis* Linné. (Fam. *Liliaceæ*.)

Part used: Flower heads.

Impurities: Not more than 5 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 12 per cent.

Habitat: Europe, Asia and Southern United States; cultivated extensively for its flowers.

Description:

Convallaria Flowers occur as a mixture of entire and broken pieces of the one-sided raceme. The *peduncles* measure 19 cm. or less in length. The *bracts* subtending each flower are thin and lanceolate. The *pedicels* curve downward and measure 1 cm. or less in length. The *perianth* is campanulate; its six lobes are ovate and acute. The *andracium* consists of six included, short-styled stamens inserted on the perianth. The *gynacium* consists of one ovary with three cells, a three-grooved style, and a three-lobed capitate stigma. The *odor* is slightly aromatic. The *taste* is sweet and slightly acrid.

Constituents: Volatile oil, resin, glucosides (convallamarin, convallarin), etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Fluidextractum Convallarise Florum; Dose, 0.5 mil (8 min.).



SAMBUCUS

1, Numerous flowers and flower buds. 2, Small panicle of flowers. 3, Stems. 4, Single flower and, above, a cluster of buds.

SAMBUCUS (Sambuc.) N. F.

English name: Sambucus.

Synonyms: Elder Flowers, American Elder, Sweet Elder.

Botanical origin: *Sambucus canadensis* Linné or *Sambucus nigra* Linné. (Fam. *Caprifoliaceæ*.)

Part used: Flower heads.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: New Brunswick to Manitoba, south to Florida and Texas.

Description:

Sambucus occurs as a mixture of entire and broken flowers and buds. The *pedicels* measure 5 mm. or less in length. The *calyx* is ovoid and its five teeth are minute. The *corolla* is greenish yellow and rotate; its lobes are ovate. The *andracium* consists of five stamens adnate to the base of the corolla and alternating with the corolla lobes. The *gynacium* consists of one pistil with a three-celled ovary and one three-parted style with three stigmas. The buds are small, greenish yellow, and globular. The *odor* is slightly aromatic. The *taste* is slightly bitter.

Constituents: Volatile oil, gum, resin, tannin, bitter glucoside, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

None.



BRAYERA

1, Flowers and stems. 2, Bract. 4, Part of a panicle.
 5, Small bracts. 6, Three flowers and a floral bract.

BRAYERA (Brayer.) N. F.

English name: Brayera.

Synonyms: Koussou, Cusso.

Botanical origin: *Hagenia abyssinica* (Bruce) Gmelin.
(Fam. *Rosaceæ*.)

Part used: Panicles of pistillate flowers.

Impurities: Not more than 10 per cent. of the staminate flowers, other parts of the tree or other matter. Reject portions of the stems over 3 mm. in diameter, and any binding material, before the drug is powdered or used.

Assay: None given.

Ash: Not more than 9 per cent.

Habitat: Abyssinia.

Description:

Brayera occurs as broken fragments or as panicles arranged in bundles, held together with spirally arranged flattened portions of the larger stems of brayera plant. The *peduncles* are tortuous and pinkish brown; the surface is sunken and hairy. At the base of the larger peduncles there is a large, oblong, two-lobed sheathing bract, and several leaves subtending the panicles. At the base of the medium-sized peduncles the bract is smaller and is associated with two leaves. The smallest peduncles are subtended by a thin, hairy ovate bract. The *pedicels* are short; each is subtended by two rounded bracts. The bractlets subtending each flower are obovate, and the veins are large, elevated, and purple. The *calyx* consists of five small calyx lobes. The *petals*, which are usually absent in the drug, are small and white. The *androeium* consists of aborted stamens. The *gynaeium* consists of a one-celled ovary, a two-parted style, and two stigmas. The *fruit* is an achene. The *odor* is indistinct. The *taste* is bitter.

Constituents: Tannin, volatile oil, resin, glucosides (kosin, koussein, etc.), etc.

Dose: 15 Gm. (240 grains).

Preparations:

Infusum Brayeræ. Dose, 250 mls (8 fl. ozs.).



ROSA GALLICA

1, Many united and separated petals. 2, Cone of imbricate petals. 3, Inner surface of the petal.

ROSA GALLICA (*Rosa* Gall.) U. S. P.

English name: Red Rose.

Synonyms: French Rose.

Botanical origin: *Rosa gallica* Linné. (Fam. *Rosaceæ*.)

Part used: Petals collected just before expansion of the flower.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 3.5 per cent.

Habitat: Southern Europe and Western Asia; cultivated in gardens.

Description:

Red Rose occurs as a mixture of entire cones and separated and broken petals. The cones consist of a great number of imbricated petals. They measure 20 mm. or less in length and 16 mm. or less in width at the base. The petals are tapering and yellow at the base. The margin is entire. The apex is rounded and notched. The outline is obcordate. The upper surface is soft and velvety and purplish red in color. The under surface is smooth and light purplish red in color; the veins are distinct. The odor is aromatic. The taste is slightly pungent and bitter.

Constituents: Volatile oil, red coloring matter, gallo-tannic acid, sugar, mucilage, quercitrin.

Dose: None given.

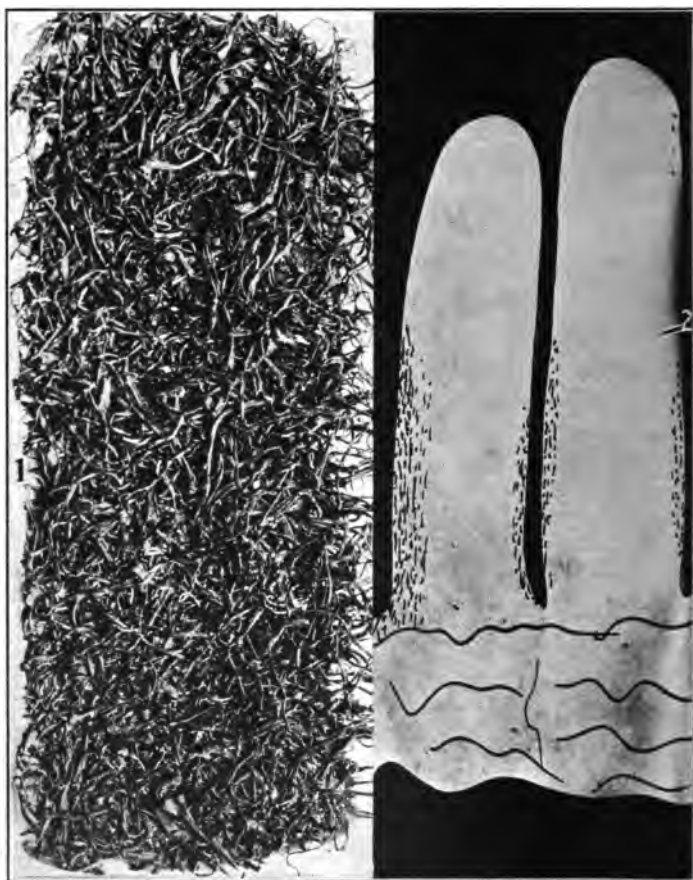
Preparations:

Fluidextractum Rosæ; Dose, 2 mls (30 min.).

Infusum Rosæ Compositum N. F.; Dose, 100 mls (3 ½ fl. ozs.).

Mel Rosæ (from fluidextract); Dose, 4 mls (1 fl. dr.).

Syrupus Rosæ N. F. (from fluidextract).



CROCUS

1, A mass of stigmas and styles. 2, Papillæ of the stigma, magnified.

CROCUS (Croc.) N. F.

English name: Crocus.

Synonyms: Saffron, Spanish Saffron.

Botanical origin: *Crocus sativus* Linné. (Fam. *Iridaceæ*.)

Part used: Stigmas.

Impurities: Not more than 10 per cent. of yellow styles or other foreign matter.

Assay: It loses not more than 14 per cent. of its weight when dried at 100° C.

Ash: Not more than 7.5 per cent. of infusible ash.

Habitat: Southern Europe and Asia.

Description:

Saffron occurs as entire or broken pieces of the styles and stigmas. The *styles* are slender and yellow. The *stigmas* are tapering below, three-lobed above, and rolled inward. The stigmas are covered with large papillæ which are visible under the high power of the microscope. The *odor* is persistent and aromatic. The *taste* is pungent.

Constituents: Volatile and fixed oils, wax, bitter principle, crocin (glucoside), etc.

Dose: None given.

Preparations:

Tinctura Croci. (Used for coloring.)



ZEa

1. Light-colored styles and stigmas. 2, Dark-colored styles and stigmas, which are worthless.

ZEA N. F.

English name: Zea.

Synonyms: Corn Silk.

Botanical origin: *Zea Mays* Linné. (Fam. *Gramineæ*.)

Part used: Fresh styles and stigmas.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Tropical America; cultivated extensively.

Description:

Fresh Corn Silk *occurs* as tangled masses of entire and broken styles. The *styles* measure 30 cm. or less in length and 5 mm. or less in diameter. The *color* varies from yellow to red to brown and to bright green. The stigma is two-parted. The drug of commerce consists of the dried styles and stigmas. This should not be used in making preparations, because it is medicinally inactive. The *odor* is not distinct. The *taste* is slightly sweet.

Constituents: Resin, maizenic acid, fixed oil, sugar, gum, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Zeæ; Dose, 4 mls (1 fl. dr.).



ARNICA

1, Many flowers. 2, Involucre bracts. 3, Pitted receptacle.
4, Peduncle. 5, Flower head.

ARNICA (Arnic.) U. S. P.

English name: Arnica.

Synonyms: Arnica Flowers.

Botanical origin: *Arnica montana* Linné. (Fam. *Compositæ*.)

Part used: Flower heads.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 9 per cent.

Habitat: Europe and Northern Asia.

Description:

Arnica occurs as a mixture of entire and broken pieces of the flowers. The peduncle is hairy and measures 3 cm. or less in length. The involucre consists of one or two rows of bracts which have a maximum length of 15 mm. The bracts are pubescent, dark green, except the edges, which are light green and linear-lanceolate in outline. The ray flowers are ligulate, pistillate and orange yellow in color. The disk flowers are perfect. The pappus consists of one circle of multicellular, multiseriate, branched hairs. The corolla is yellow, tubular below and five-toothed above. The andræcium consists of five exerted stamens with their anthers united and around the style. The gynæcium consists of one pistil with a one-celled ovary, one style, and a two-parted stigma. The fruit is an achene with a pappus. The receptacle is convex, pitted, hairy, and solid. The odor is aromatic. The taste is bitter and acrid.

Constituents: Bitter principle (arnicin), alkaloid (arnicine), volatile oil, fat, resin, etc.

Dose: None given.

Preparations:

Fluidextractum Arnicæ N. F.; Dose, 0.1 mil (1½ min.).
Tinctura Arnicæ; Dose, 1 mil (15 min.).



CALENDULA

1, Many flowers. 2, Involucre bracts. 3, Flower head.
4, Disk flowers. 5, Ray flowers.

CALENDULA (Calend.) N. F.

English name: Calendula.

Synonyms: Marigold, Holligold, Mary-bud.

Botanical origin: *Calendula officinalis* Linné. (Fam. *Compositæ*.)

Part used: Flower heads.

Impurities: Not more than 2 per cent. of other parts of the plant or other foreign matter.

Assay: None given.

Ash: Not more than 11 per cent.

Habitat: Southern Europe and parts of Asia.

Description:

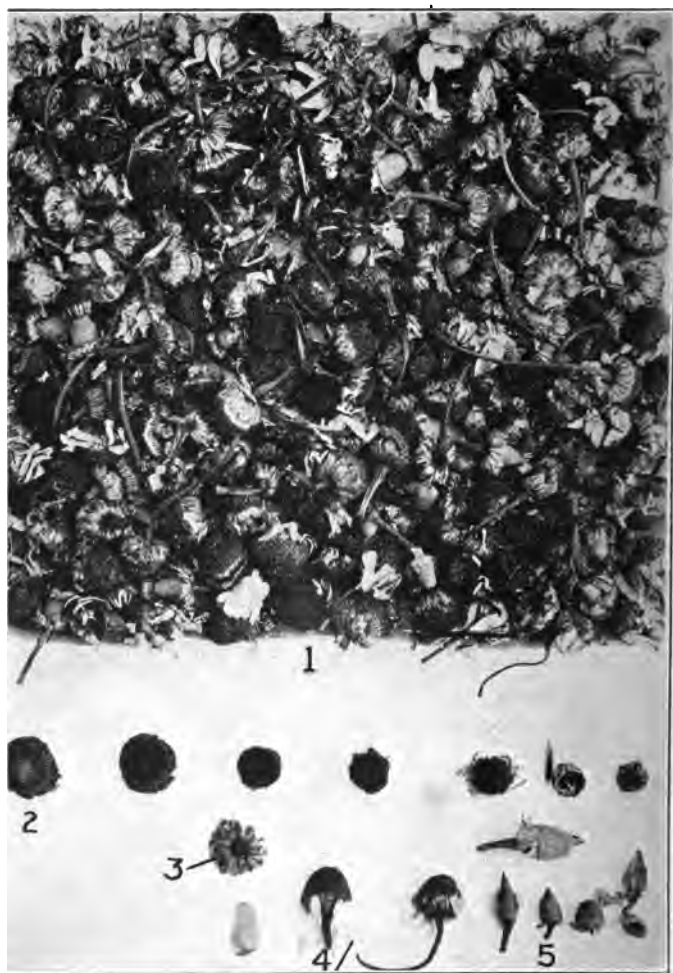
Calendula occurs as entire ligulate flowers mixed with a few flower heads. The flower heads have a short, thick, curved peduncle. The involucre consists of oblong-lanceolate, hairy, greenish gray bracts. The individual flowers are yellow, mostly ligulate, and they have a maximum length of 26 mm. These flowers are oblanceolate, two to three-toothed and two to six-veined. The basal part of the flower is incurved and encloses a bifid stigma. The tubular flowers are small and five-lobed. The receptacle is rough. The seeds are angled and dark brown. The odor is slight. The taste is slightly salty and bitter.

Constituents: Gum, coloring matter, volatile oil, bitter principle, calendulin, etc.

Preparations:

Fluidextractum Calendulæ. (Used as a coloring agent and local irritant.)

Tinctura Calendulæ. (Used externally.)



MATRICARIA

1, Mass of flower heads. 2, Heads of variable size. 3, Involucre. 4, Head with reflex petals. 5, Receptacles of variable size.

MATRICARIA (Matricar.) U. S. P.

English name: Matricaria.

Synonyms: German Chamomile, Wild Chamomile.

Botanical origin: *Matricaria Chamomilla* Linné.
(Fam. *Compositæ*.)

Part used: Flower heads.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 13 per cent.

Habitat: Europe and Western Asia; naturalized in the United States, New York southward.

Description:

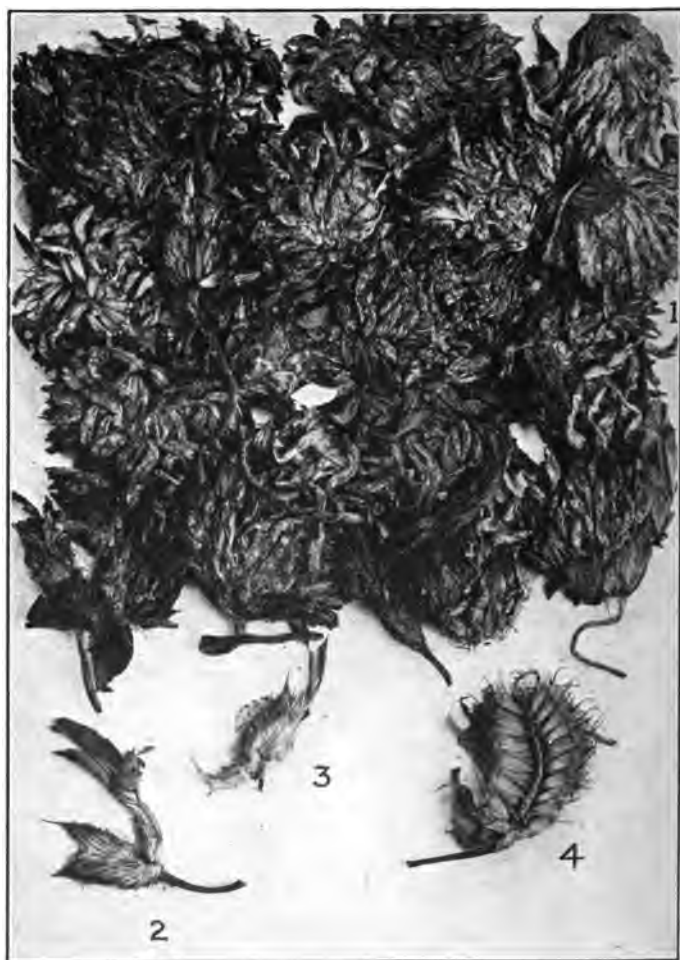
Matricaria occurs as a mixture of entire heads and separate and broken fragments of the flowers and stems. The *peduncles* are furrowed and measure 2.5 cm. or less in length. The *involucre* is saucer-shaped. The *bracts*, which are in two or more series, are imbricate and oblong; their central portions are dark green and their margins lighter-colored. Their *apexes* are obtuse. The *ray flowers*, which number as many as twenty, are pistillate and white; the *ligules* are linear-oblong, indistinctly four-nerved and three-toothed. They usually bend back upon the peduncle. The *disk flowers* are perfect. The *pappus* is not present. The *corolla* is yellow, tubular below and five-toothed above. The *androeium* consists of five stamens. The *gynaeium* consists of one pistil with a one-celled ovary, one style, and a two-parted pistil. The *fruit* is a three- to five-ribbed achene. The *receptacle* is pitted and naked and varies in form from lanceolate to ovoid to orbicular. The *odor* is sweet and aromatic. The *taste* is pungent and bitter.

Constituents: Volatile oil, bitter extractive, tannin, etc.

Dose: 15 Gm. (4 drachms).

Preparations:

None.



TRIFOLIUM

- 1, Flower heads. 2, Stipules. 3, Side view of the stipules.
4, Flower head with part of the flowers removed.

TRIFOLIUM (Trifol.) N. F.

English name: Trifolium.

Synonyms: Red Clover Blossoms, Honeysuckle Clover Blossoms.

Botanical origin: *Trifolium pratense* Linné. (Fam. *Leguminosæ*.)

Part used: Flower heads.

Impurities: None given.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Southern British America and the United States.

Description:

Trifolium occurs as a mixture of entire and broken fragments of the flower heads of papilionaceous flowers. The *stipules* are two-lobed, prominently veined and hairy, and associated with a small three-foliate leaf. The *calyx* is hairy and tubular and its five teeth are subulate. The *corolla* is united into a tube; the standard is longer and broader than the two wings; the heel is short. The *androecium* consists of ten stamens in two groups, nine together and one separate. The *gynæcium* consists of one pistil with a one-celled ovary with many ovules, and one style. The *fruit* is a several-seeded legume enclosed in the persistent calyx. The *odor* is slightly aromatic. The *taste* is sweet and slightly bitter.

Constituents: Glucosides, tannin, resins, fat, chlorophyll, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Trifolii; Dose, 4 mls (1 fl. dr.).

CHAPTER XIII

FRUITS

THE official fruits are grouped into eight classes, as follows: Drupes, achenes, berries, cremocarps, capsules, multiple fruits, collective fruits, and legumes.

1. **Drupes.** Drupes are fruits having a thin skin (epicarp), a fleshy pulp (sarcocarp), and a hard endocarp (putamen) around the seed. There are two classes of official drupes: those with one stone (putamen and seed), and those with more than one stone. Prune has one stone; pimenta has two or three stones; rhamnus cathartica contains three or four stones.

2. **Achenes.** Malt (barley, germinated and dried) is an example of a caryopsis, an achene-like fruit in which the pericarp and seed are grown together.

3. **Berries.** A berry is a fruit in which the seed is directly embedded in the pulp. Solanum is a typical fruit; the skin (epicarp) is thin, the pulp is fleshy, and the seeds are embedded in it.

4. **Cremocarps.** A cremocarp is a fruit composed of two mericarps (achenes) held together by a carpophore. The official cremocarps are fennel, caraway, angelica, anise, parsley, conium, celery and coriander. Of these, parsley and conium are the only ones likely to be confused; therefore their structure should be compared closely.

5. **Capsules.** A capsule is a dehiscent fruit composed of a mature compound (more than one) pistil. Cassia fistula, vanilla, poppy, and prickly ash are capsules. They differ in size, structure, etc.

6. **Multiple Fruits.** The multiple fruits are those in which several ripened pistils from several flowers

form the fruit. Juniper, hops and figs are multiple fruits.

7. **Aggregate Fruits.** An aggregate fruit is one in which several ripened pistils from one flower form the fruit. The two official aggregate fruits are red raspberry and blackberry.

8. **Legumes.** A legume is a fruit composed of one carpel (monocarpellary) which opens (dehiscens) along two sutures to discharge the seed, as in bean or pea. Tamarind is a legume. The pod should be removed in the official drug; when the pod is removed, all resemblance to a fruit is destroyed.



PRUNUM

1, Five prunes of variable size. 2, Pulp removed from the pit. 3, Pit or stone removed. 4, Seed in the putamen.

PRUNUM N. F.

English name: Prune.

Synonyms: None.

Botanical origin: *Prunus domestica* Linné. (Fam. *Rosaceæ*.)

Part used: Ripe fruit, partly dried.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Asia; universally cultivated.

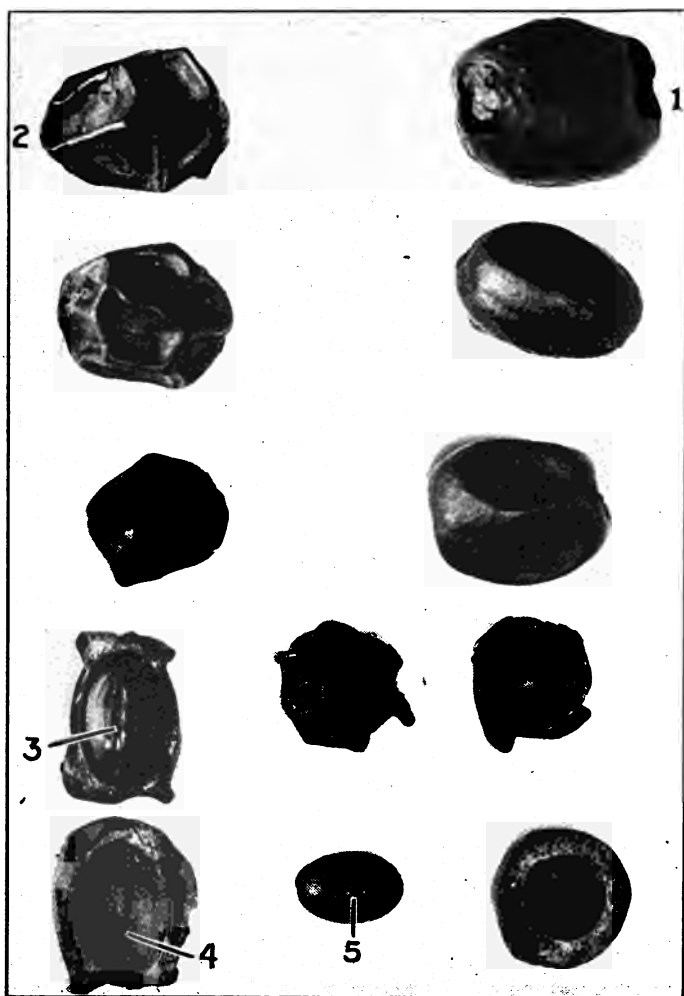
Description:

Prune occurs as entire, irregularly compressed fruits. Prunes are *drupes*. The *outline* varies from oval to elliptical. They measure 4 cm. or less in length and 3.5 cm. or less in width. The *color* is brownish black. The *surface* is smooth, sunken, sticky, and slightly grooved on one side, with a depressed stalk scar at the base. The *epicarp* is tough. The *sarcocarp* is yellowish brown and soft. The *putamen* is flattened, hard, and ridged near the edge of the two flattened surfaces. The *seed* is light brown, hairy, furrowed, rounded at one end and pointed at the other. The seeds measure 3 cm. or less in length and 2 mm. or less in width. The seeds are aromatic. The *taste* is pungent and bitter. The putamen and seed should be rejected when making preparations. The *odor* of the pulp of prunes is aromatic. The *taste* is sweet.

Constituents: Sugar, pectin, albumin, malic and tartaric acids, potassium salts, etc.

Preparations:

Ingredient of *Confectio Sennæ*.



SABAL

1, Fresh berries. 2, Partially dried fruits. 3, Seed in the endocarp. 4, Seed removed from the endocarp. 5, Seed; to the right, cross-section of sarcocarp with oil cavities.

SABAL U. S. P.

English name: Sabal.

Synonyms: Saw Palmetto Berries.

Botanical origin: *Serenoa serrulata* (Michaux)
Hooker filius. (Fam. *Palmæ*.)

Part used: Ripe fruit, partially dried.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: North Carolina and Arkansas, south to Florida and Texas.

Description:

Sabal occurs as entire fruits. Sabal is a drupe. The outline varies from oval to elliptical. It measures 25 mm. or less in length and 18 mm. or less in width. The color varies from brownish black to black. The surface is smooth, even or sunken, oily or dry. The base has a short stalk or stem scar. The apex has a style scar. The epicarp is tough. The sarcocarp is yellowish brown, fibrous and soft. The endocarp is reddish brown and fibrous on the outer surface; the inner surface is smooth. The seed is yellowish or reddish brown, ellipsoidal and waxy when cut; the raphe side is elevated. The odor is aromatic. The taste is sweet, pungent and acrid.

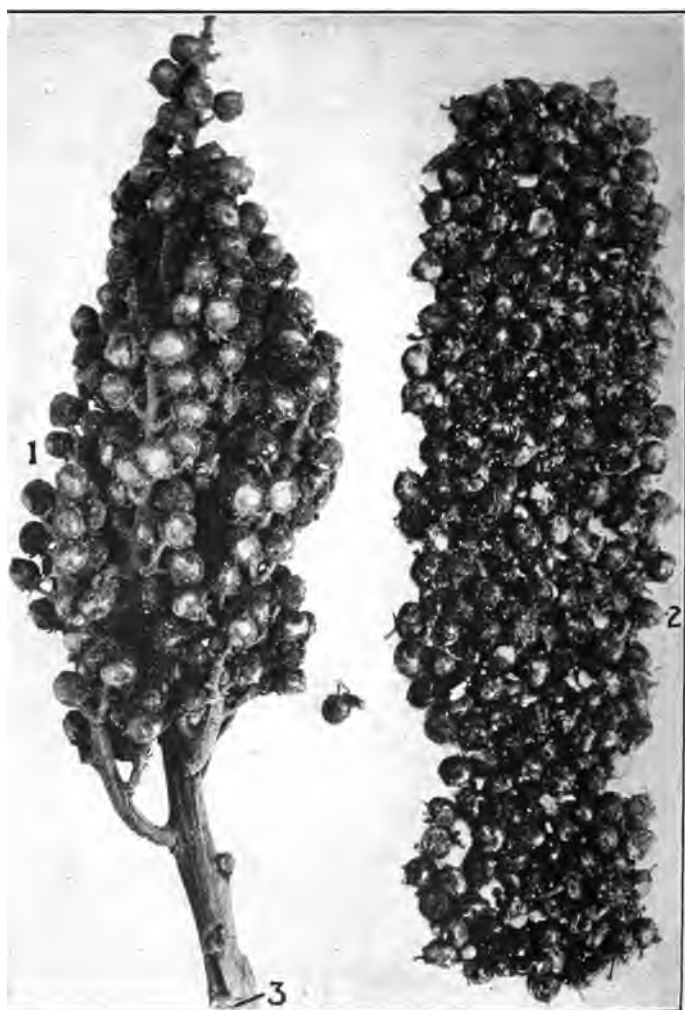
Constituents: Volatile and fixed oils, resin, sugar, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Sabal; Dose, 1 mil (15 min.).

Tinctura Sabal et Santali N. F.; Dose, 4 mils (1 fl. dr.).



RHUS GLABRA

1, Branched stem with fruits. 2, Fruits. 3, Larger stem.

RHUS GLABRA (Rhus Glab.) N. F.

English name: Rhus Glabra.

Synonyms: Sumac Berries, Scarlet Sumac Fruit.

Botanical origin: *Rhus glabra* Linné. (Fam. *Anacardiaceæ*.)

Part used: Ripe fruit.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: None given.

Ash: Not more than 4 per cent.

Habitat: Asia, Europe and Northern North America.

Description:

Rhus glabra occurs as entire fruits. *Rhus glabra* is a *drupe*. The *outline* is subglobose and slightly compressed. The *fruit* measures 4 mm. or less in length and 5 mm. or less in diameter. The *color* is dark red. The *base* of the fruit is frequently attached to a slender pedestal bearing a five-cleft calyx. The *apex* has the persistent remains of a three-parted black style. The *surface* is hairy and rough. The *epicarp* and *mesocarp* are thin. The *endocarp* is smooth, hard and brittle, and it separates from the outer layers. The *seeds* are slightly reniform and smooth, and have a light-colored *hilum*. The *odor* is not distinct. The *taste* is sour and astringent.

Constituents: Malic, tannic and gallic acids, fixed and volatile oils, coloring matter, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Rhois Glabræ; Dose, 1 mil (15 min.).



CUBEBA

1, Many fruits. 2, Large fruits. 3, Small fruits. 4, Seed in the pericarp. 5, Stems.

CUBEBA (Cubeb.) U. S. P.

English name: Cubeb.

Synonyms: Cubebs, Cubeb Berries.

Botanical origin: *Piper Cubeba* Linné filius. (Fam. *Piperacæ*.)

Part used: Unripe fruit, full grown.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: Not less than 10 per cent. of volatile extractive, soluble in ether.

Ash: Not more than 8 per cent.

Habitat: East and West Indies, Ceylon.

Description:

Cubeb occurs as a mixture of entire fruits and stems. Cubeb is a *drupe*. The outline of the upper portion is globular, acute and pointed; the lower portion tapers into a thecaphore. Cubeb measures 2 cm. or less in length and 7 mm. or less in width. The thecaphore measures 14 mm. or less in length. The color varies from brownish to bluish to grayish black. The surface of the globular portion is reticulate, of the thecaphore wrinkled. The *epicarp* is thin. The *mesocarp* is greenish brown and oily. The *endocarp* is hard and smooth on the inner surface. The *seed* is reddish brown and smooth; one end is slightly elevated. The *odor* is aromatic. The *taste* is strongly pungent.

Constituents: Volatile and fixed oils, cubebic acid, resin, fatty oil, gum, cubebin, etc.

Dose: 1 Gm. (15 grains).

Preparations:

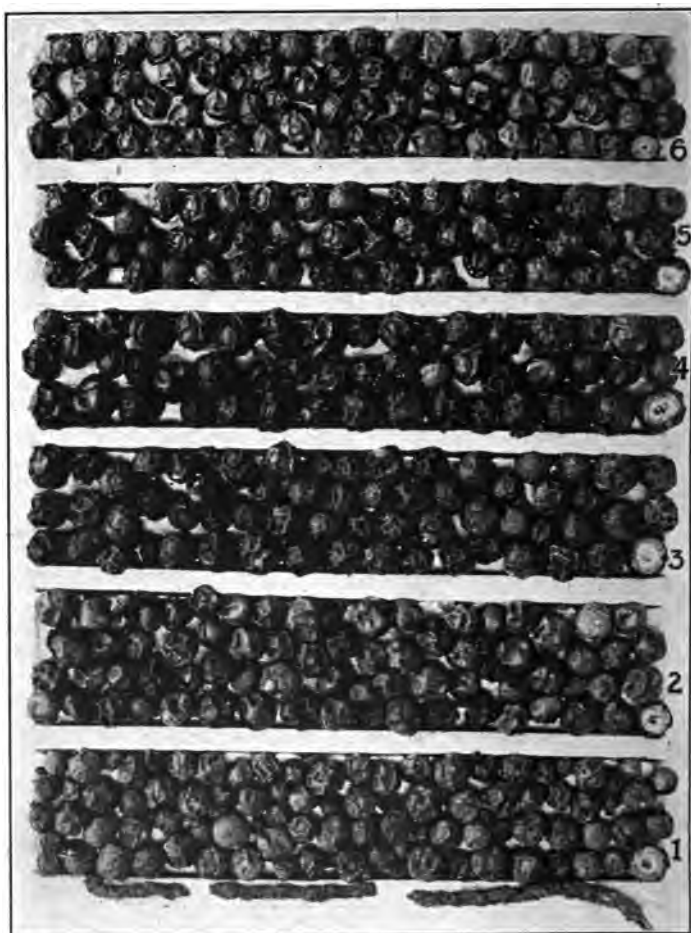
Fluidextractum Cubebe N. F.; Dose, 1 mil (15 min.).

Oleoresina Cubebe; Dose, 0.5 Gm. (8 grains).

Oleum Cubebe N. F.; Dose, 0.5 mil (8 min.).

Tinctura Cubebe N. F.; Dose, 4 mils (1 fl. dr.).

Trochisci Cubebe (from Oleoresin).



PIPER

1-6, Varieties of Black Pepper.

PIPER U. S. P.

English name: Pepper.

Synonyms: Black pepper.

Botanical origin: *Piper nigrum* Linné. (Fam. *Piperaceæ*.)

Part used: Unripe fruit.

Impurities: Not more than 2 per cent. of stems or other foreign matter.

Assay: Not less than 6 per cent. of non-volatile extract, soluble in ether. Not less than 25 per cent. of starch.

Ash: Not more than 7 per cent. The amount of ash insoluble in diluted hydrochloric acid does not exceed 2 per cent. of the weight of pepper taken.

Habitat: West and East Indies; cultivated in Singapore, Ceylon, Penang, etc.

Description:

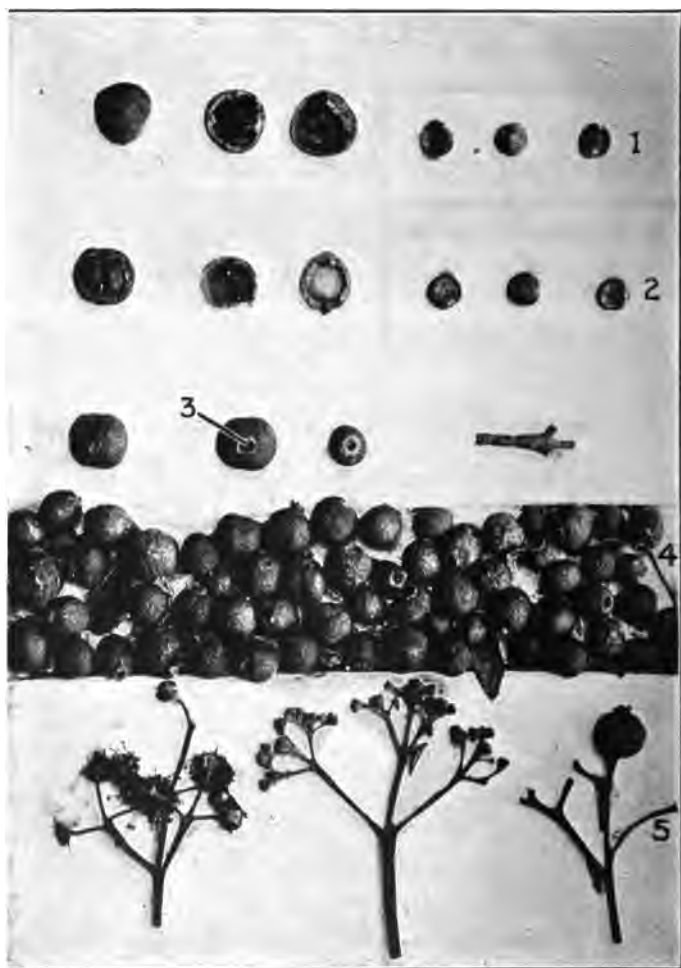
Pepper occurs as entire fruits. It is a *drupe*. The outline is nearly globular. The fruits measure 6 mm. or less in diameter. The color of the different varieties of pepper varies from grayish to brownish to black. The surface is coarsely reticulate and dull. The *epicarp* is thin and dark colored. The *mesocarp* is thin. The *endocarp* is light colored. The seed adheres to the endocarp; it is yellowish green in the outer layers, yellow or gray around the cavity. The odor is aromatic. The taste is strongly pungent.

Constituents: Alkaloids (piperidine, piperine), resin, volatile oil, proteids, starch, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Oleoresina Piperis; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).



PIMENTA

1, Three seeds from a three-carpeled fruit. 2, Seeds from a two-carpeled fruit. 3, Several fruits. 4, Mass of fruits. 5, Flowers and fruit attached to stem.

PIMENTA (Piment.) N. F.

English name: Pimenta.

Synonyms: Allspice, Clove Pepper.

Botanical origin: *Pimenta officinalis* Lindley. (Fam. *Myrtaceæ*.)

Part used: Nearly ripe fruit.

Impurities: Not more than 5 per cent. of stems or other foreign matter.

Assay: Crude fiber does not exceed 25 per cent.

Ash: Not more than 6 per cent.

Habitat: West Indies, Mexico, and South America.

Description:

Allspice occurs as a mixture of entire fruits and broken stems. Allspice is a two to three-celled and seeded inferior drupe. The outline varies from globular to sub-globular. It measures 6 mm. or less in length and 8 mm. or less in width. The color varies from light to dark reddish brown. The surface is rough and granular. The base has a short stalk or a stem scar; the apex has a calyx ring and frequently minute blunt teeth. The apex is depressed within the calyx ring, and there are the remains of a persistent style in the center of the depression. Two-seeded forms are slightly grooved on two sides and three-seeded forms on three sides. The epicarp is thin. The mesocarp is yellowish and porous. The endocarp is brown, smooth and shiny. The dissepiments are thin and papery. The seeds of two-celled forms are flattened on their inner face and rounded on their outer face. The seeds of three-celled forms have two flat surfaces and an outer rounded surface. They are reddish brown and smooth. The odor is aromatic. The taste is sweet and pungent.

Constituents: Volatile oil, resin, tannin, sugar, mucilage, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Oleum Pimentæ U. S. P.; Dose, 0.2 mil (3 min.).



RHAMNUS CATHARTICA

1. Fruits of variable size. 2, Persistent pedicle.

RHAMNUS CATHARTICA (Rhamn. Cath.) N. F.

English name: Rhamnus Cathartica.

Synonyms: Buckthorn Berries.

Botanical origin: *Rhamnus cathartica* Linné. (Fam. *Rhamnaceæ*.)

Part used: Ripe fruit.

Impurities: Not more than 5 per cent. of unripe fruit or other foreign matter.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Europe, Northern Asia and North America.

Description:

Rhamnus Cathartica occurs as entire fruits. The outline varies from rounded to egg-shaped. The fruits measure 8 mm. or less in length and 8 mm. or less in diameter. The color varies from dark purple to black. The surface is rough and wrinkled. A pedicel is frequently attached to the basal part of the fruit. The fruit varies from three- to four-celled, and each cell may contain a nutlet. The odor is aromatic. The taste is sweet and bitter.

Constituents: Coloring matters, tannin, glucosides, emodin, sugar, pectin, gum, bitter principle, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Rhamni Cathartice; Dose, 1 mil (15 min.).
Syrupus Rhamni Cathartice; Dose, 8 mls (2 fl. drs.).



MALTUM

1, Fruits of variable size. 2, Groove at one side of the fruit. 3, Fruit freed of pales. 4, Cross-section of the fruit.

MALTUM U. S. P.

English name: Malt.

Synonyms: Barley Malt.

Botanical origin: *Hordeum sativum* Jessen. (Fam. Gramineæ.)

Part used: Grain partially germinated and then dried.

Impurities: None given in U. S. P.

Assay: Capable of converting not less than five times its weight of starch into sugars.

Ash: None given.

Habitat: Western Asia, Egypt; cultivated.

Description:

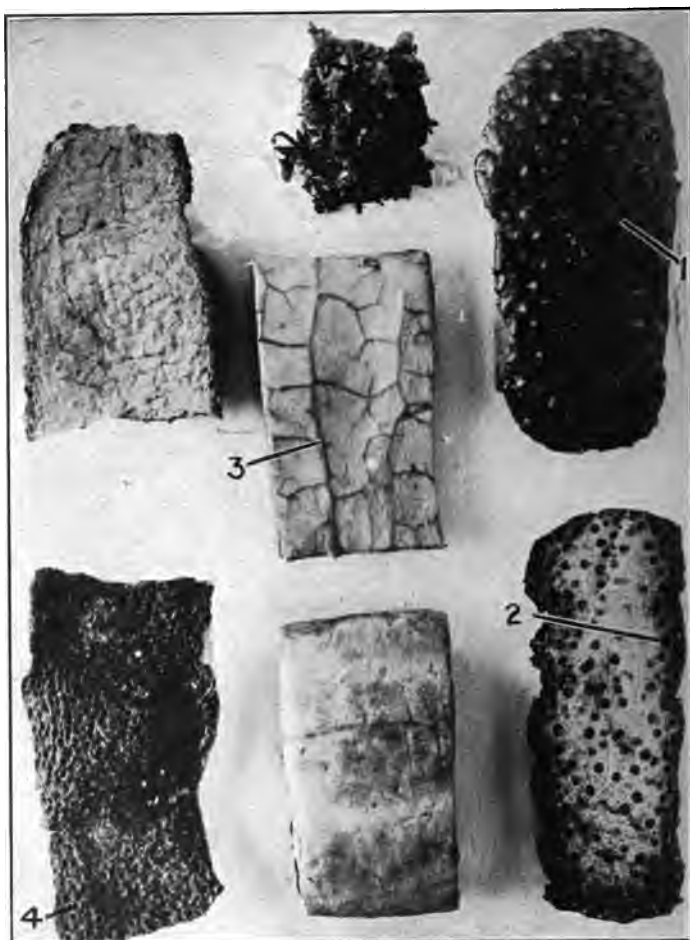
Barley Malt occurs as entire grains. Barley is an *achene*. Barley is ovate-lanceolate in outline. It measures 15 mm. or less in length and 5 mm. or less in diameter. The *base* is constricted. The *apex* is acuminate. The *color* is grayish yellow. The *pales* are imbricated. The fruit, freed of pales, is yellowish brown and rounded at the base, grooved on one side, and acuminate and hairy at the apex. Sections of the lower portions of the fruit are reniform. The *outer layer* is brown, the *inner* nearly white. The *fracture* is brittle. The *odor* is slight. The *taste* is sweet.

Constituents: Diastase, hordenine (alkaloid), etc.

Dose: None given in U. S. P.

Preparations:

Extractum Malti; Dose, 15 Gm. (4 drachms).



AURANTII DULCIS CORTEX

1, Outer surface of the fresh rind. 2, Inner surface showing the oil cavities. 3, White inner layer of the rind. 4, Dried worthless rind with sunken oil cavities.

AURANTII DULCIS CORTEX (Aurant. Dulc.
Cort.) U. S. P.

English name: Sweet Orange Peel.

Synonyms: None.

Botanical origin: *Citrus Aurantium sinensis* Gallezio.
(Fam. *Rutaceæ*.)

Part used: Outer rind of the fresh, ripe fruit.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Widely cultivated, Florida, California, etc.

Description:

The, fresh, outer rind of orange may be removed by peeling or grating. In no case should the white inner layer of the rind be used. Orange is a *hesperidium*. The *outline*, measurements, etc., do not need to be considered, since the fresh fruit is used in separating the rind. The *color* is orange yellow. The *surface* has numerous convex oil cavities surrounded by a smooth, shiny surface. The *odor* is aromatic. The *taste* is pungent.

Constituents: Volatile oil, bitter principle, resin, gum, tannin, etc.

Dose: None given officially.

Preparations:

Oleum Aurantii; Dose, 0.2 mil. (3 min.).

Syrupus Aurantii (from Tincture).

Tinctura Aurantii Dulcis; Dose, 4 mils (1 fl. dr.).



LIMONIS CORTEX

1, Outer surface of fresh rind. 2, Inner surface showing oil cavities. 3, White inner layer of the rind. 4, Dried worthless peel.

LIMONIS CORTEX (Limon. Cort.) U. S. P.

English name: Lemon Peel.

Synonyms: None.

Botanical origin: *Citrus medica Limonum* (Risso)
Hooker filius. (Fam. *Rutaceæ*.)

Part used: Outer rind of the fresh ripe fruit.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Widely cultivated in Florida and United States, etc.

Description:

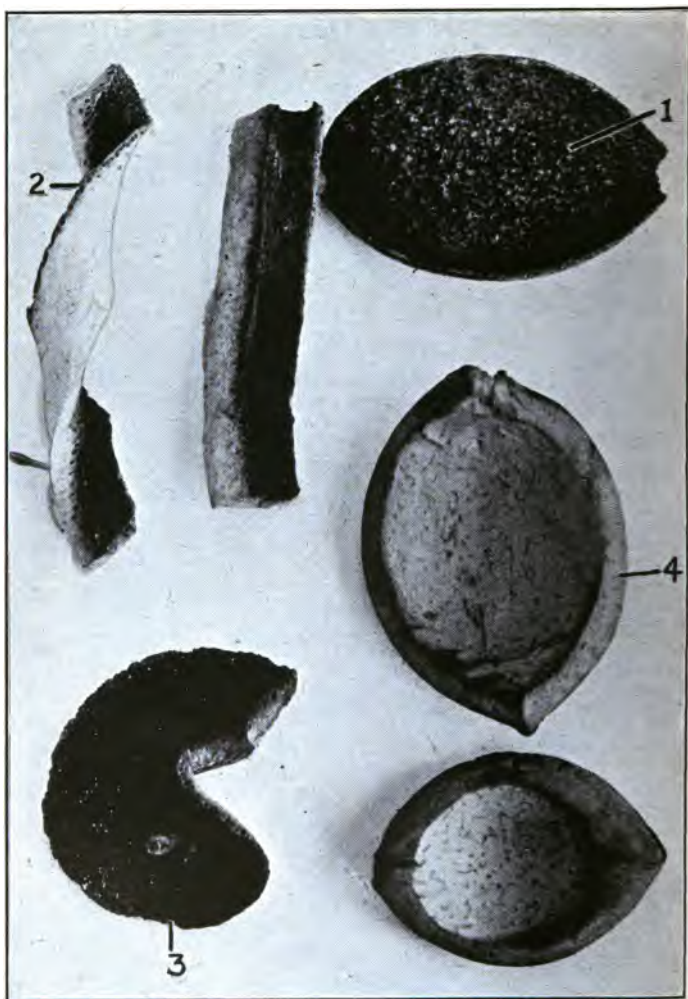
The fresh, outer rind of lemon may be removed by peeling or by grating. In no case should the white inner layer of the rind be used. Lemon is a *hesperidium*. The *outline*, measurements, etc., do not need to be considered, since the fresh fruit is used in separating the rind. The *color* is lemon yellow. The *surface* has numerous convex oil cavities surrounded by a smooth, shiny surface. The *odor* is aromatic. The *taste* is pungent.

Constituents: Volatile oil, bitter principles, resin, etc.

Dose: None given.

Preparations:

Oleum Limonis; Dose, 0.2 mil (3 min.).
Tinctura Limonis Corticis (flavoring agent).



AURANTII AMARI CORTEX

1, Outer surface of the peel. 2, Ribbons or narrow peelings. 3, Persistent calyx. 4, Inner surface of the rind.

AURANTII AMARI CORTEX (Aurant. Amar.
Cort.) U. S. P.

English name: Bitter Orange Peel.

Synonyms: None in common use.

Botanical origin: *Citrus Aurantium amara* Linné.
(Fam. *Rutaceæ*.)

Part used: Dried rind.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Cultivated extensively in the subtropics.

Description:

Bitter orange peel occurs cut into quarters, eighths, or ribbons; the latter may be straight or curved. Bitter orange is a *hesperidium*. The outline of the pieces is irregular. The pieces are of variable length and they measure 8 mm. or less in thickness. The color of the outer surface varies from yellowish brown to dark green, of the inner surface grayish yellow. The outer surface is revolute along the cut edges; it is rough and has great numbers of circular, sunken oil cavities. Some pieces have the remains of the calyx attached. The inner surface is rough with numerous slightly elevated vascular bundles. The odor is aromatic. The taste is pungent and bitter.

Constituents: Volatile oil, bitter principles, acrid resin, gum, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Fluidextractum Aurantii Amari; Dose, 1 mil (15 min.).

Oleum Aurantii Amari N. F.; Dose, 0.2 mil (3 min.).

Tinctura Aurantii Amari; Dose, 4 mils (1 fl. dr.).

Tinctura Cinchonæ Composita; Dose, 4 mils (1 fl. dr.).

Tinctura Gentianæ Composita; Dose, 4 mils (1 fl. dr.).

Vinum Aurantii Compositum N. F.; Dose, 4 mils (1 fl. dr.).



COLOCYNTHIS

1, Part of a compressed cake of colocynth pulp. 2, Portions of the pulp free of seed, one piece showing seed cavities. 3, Seeds.

COLOCYNTHIS (Colocyn.) U. S. P.

English name: Colocynth.

Synonyms: Colocynth Pulp, Bitter Apple, Colocynth Apple.

Botanical origin: *Citrullus Colocynthis* (Linné) Schrader. (Fam. *Cucurbitaceæ*.)

Part used: Dried pulp.

Impurities: Not more than 5 per cent. of seed or 2 per cent. of epicarp.

Assay: None given.

Ash: Not more than 15 per cent.

Habitat: Mediterranean region and Africa.

Description:

Colocynth occurs as compressed cakes or as pieces of variable size mixed with epicarp and seeds. The outline of the pieces is irregular, and the size of the pieces is variable. The color varies from grayish white to yellow. The surface is soft, spongy, and frequently rough from depressions caused by seeds. The seeds vary from yellow to greenish brown; they are ovate in outline and laterally compressed. The epicarp is yellow and tough and resembles dried cucumber rind. The odor is not distinct. The taste is very strongly and persistently bitter.

Constituents: Colocynthin, pectin, gum, fixed oil, phosphates, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

Extractum Colocynthis; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).

Extractum Colocynthis Compositum (from Extract); Dose, 0.25 Gm. (4 grains).

Pilulæ Catharticæ Compositæ (from Compound Extract); Dose, 2 pills.

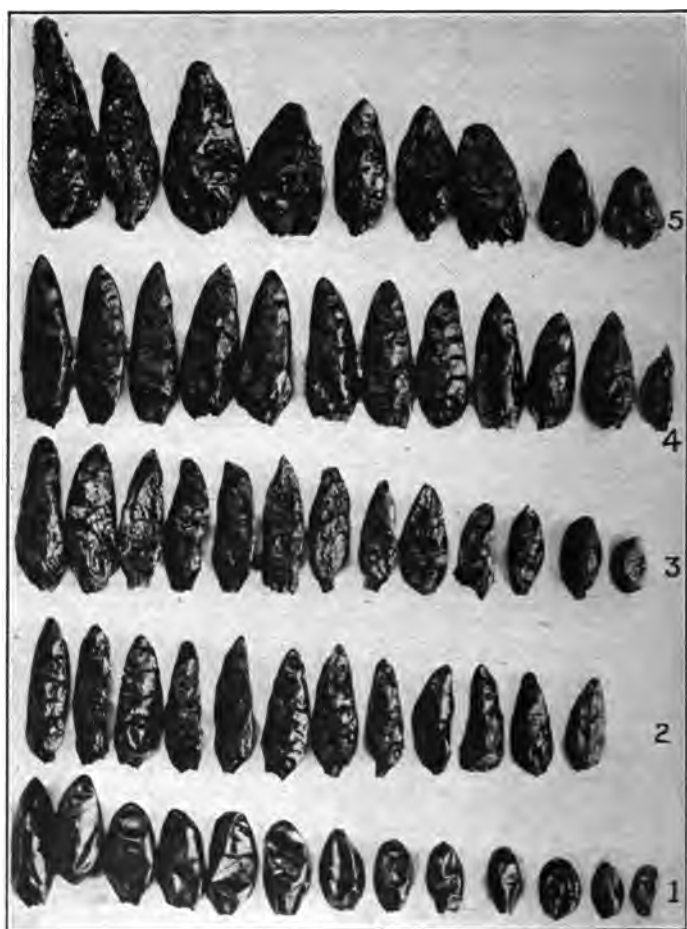
Pilulæ Catharticæ Vegetabiles N. F. (from Compound Extract); Dose, 2 pills.

Pilulæ Colocynthis Compositæ N. F. (from Extract); Dose, 1 pill.

Pilulæ Colocynthis et Hyoscyami N. F. (from Extract); Dose, 1 pill.

Pilulæ Colocynthis et Podophylli N. F. (from Compound Extract); Dose, 1 pill.

Pilulæ Laxativæ Post-Partum N. F. (from Compound Extract); Dose, 1 pill.



CAPSICUM

1, Mexican capsicum. 2, Mombasa capsicum. 3, Sierra Leone capsicum. 4, Nyassaland capsicum. 5, African capsicum.

CAPSICUM (Caps.) U. S. P.

English name: Capsicum.

Synonyms: Red or Cayenne Pepper; Mexican, Mombassa, African or Sierra Leone Pepper; Chillies.

Botanical origin: *Capsicum frutescens* Linné. (Fam. *Solanaceæ*.)

Part used: Ripe fruit.

Impurities: Not more than 2 per cent. of stems, calyxes, or other foreign matter.

Assay: Not less than 15 per cent. of non-volatile extractive, soluble in ether. 28 per cent. crude fiber.

Ash: Not more than 7 per cent. The amount of ash insoluble in hydrochloric acid does not exceed 1 per cent. of the weight of capsicum taken.

Habitat: South America.

Description:

Capsicum occurs as entire fruits attached to and mixed with pedicles and calyxes. Capsicum is a *berry*. The *outline* varies from oval to ovate to oblong-conical. The *base* is constricted and is attached to a pedicel and a persistent five-toothed calyx, or is free from these. The *apex* is acuminate or acute. The *fruits* vary greatly in size. Mexican capsicums measure 19 mm. or less in length and 6 mm. or less in diameter. Mombassa capsicums measure 18 mm. or less in length and 6 mm. or less in diameter. Sierra Leone capsicums measure 19 mm. or less in length and 6 mm. or less in diameter. Nyassaland capsicums measure 21 mm. or less in length and 7 mm. or less in diameter. African capsicums measure 26 mm. in length and 10 mm. in diameter. The *colors* of the different varieties vary. The Mexican variety is deep red; the Mombassa variety is mostly light red; the Sierra Leone variety is light red, yellow and brown; the Nyassaland variety is red, yellow; the African variety is yellowish brown, red, gray and greenish red. The *epicarp* is thin and tough. The seeds are compressed and pointed. The *odor* is aromatic. The *taste* is pungent and warming.

Constituents: Proximate principles (capsaicin, capsinin, etc.), red coloring matter, wax, resin, fixed and volatile oils, acids.

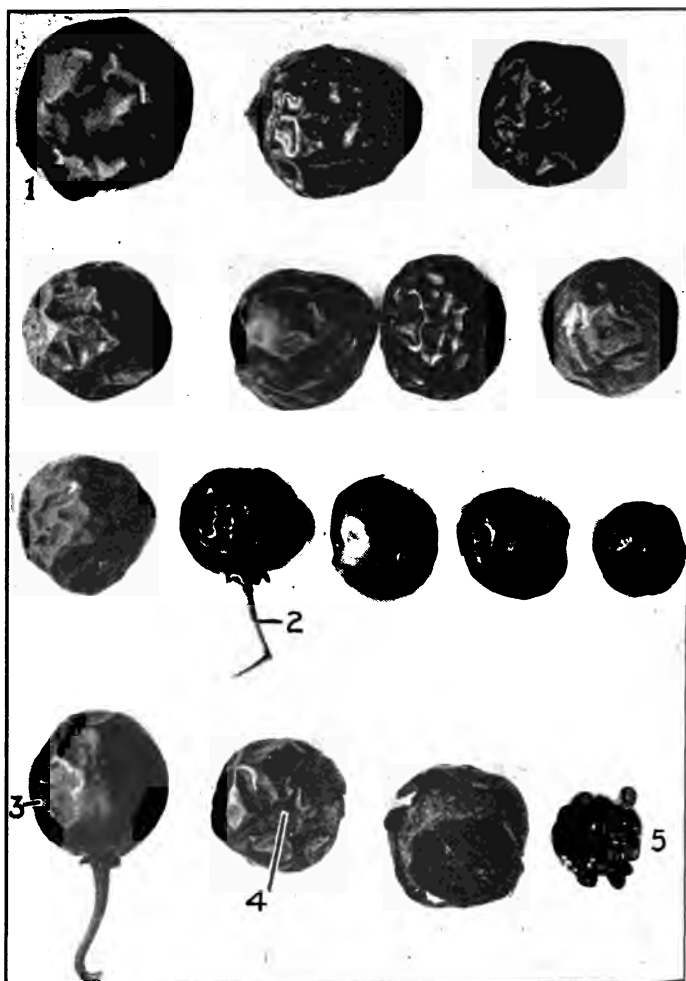
Preparations:

Emplastrum Capsici (from Oleoresin).

Oleoresina Capsici; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).

Tinctura Capsici; Dose, 0.5 mil (8 min.).

Tinctura Capsici et Myrrhæ N. F.; Dose, 2 mils (30 min.).



SOLANUM

- 1, Fruits of variable size. 2, Pedicle and persistent calyx.
3, Sunken surface of the fruit. 4, Pedicle scar. 5, Seeds.

SOLANUM (Solan.) N. F.

English name: Solanum.

Synonyms: Horse-nettle Berries.

Botanical origin: *Solanum carolinense* Linné. (Fam. Solanaceæ.)

Part used: Ripe fruit.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Ontario to Illinois, south to Florida and Texas.

Description:

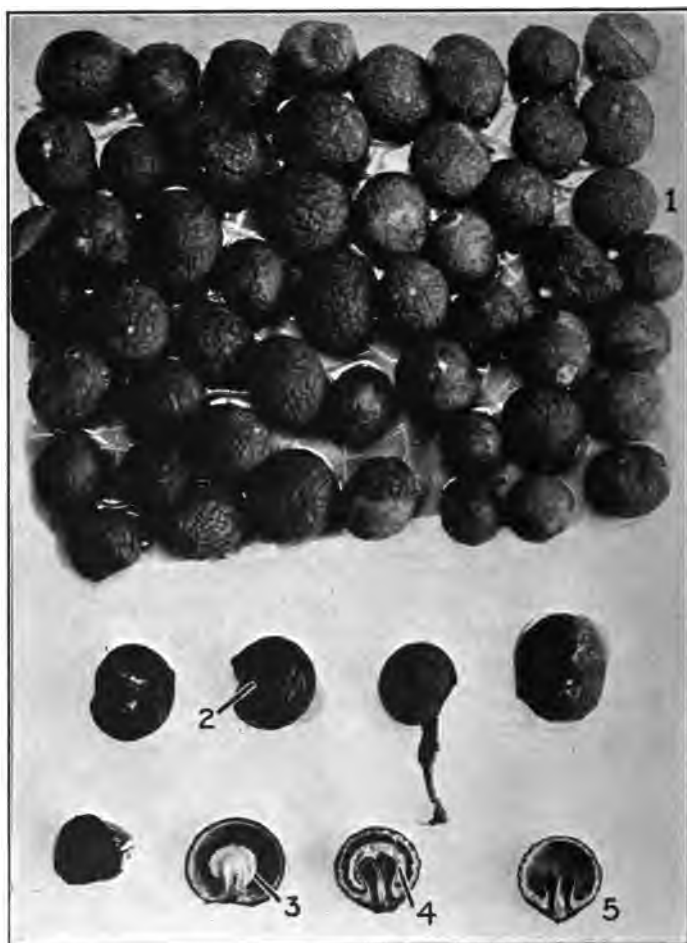
Solanum occurs as entire and broken fruits. It is a berry. The *outline* varies from globose to subglobose. The *fruits* measure 2 cm. or less in width and 15 mm. in length. The *color* varies from light yellow to orange and to reddish brown. The *base* is frequently attached to a pedicel bearing a persistent calyx. The *surface* is sunken and shiny and the base frequently has a pedicle scar. The *pericarp* is thin and brittle. The *fruit* is two-celled and many-seeded. The *seeds* are flattened, slightly reniform and shiny. The *odor* is aromatic. The *taste* is bitter and acrid.

Constituents: Alkaloids (solanine, solanidine), fat, resin, volatile oil, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Solani; Dose, 4 mls (1 fl. dr.).



COCCULUS INDICUS

1, Fruits of variable size. 2, Side view of fruit showing the reniform outline. 3, Longitudinal section of the fruit with endosperm removed. 4, Cross-section of fruit with endosperm. 5, Cross-section free of endosperm.

COCULUS INDICUS (Coccul. Ind.) N. F.

English name: Cocculus Indicus.

Synonyms: Fish-berry, Indian Berry.

Botanical origin: *Anamirta Cocculus* (Linné) Wight et Arnott. (Fam. *Menispermaceæ*.)

Part used: Dried fruit.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Ceylon, East Indies.

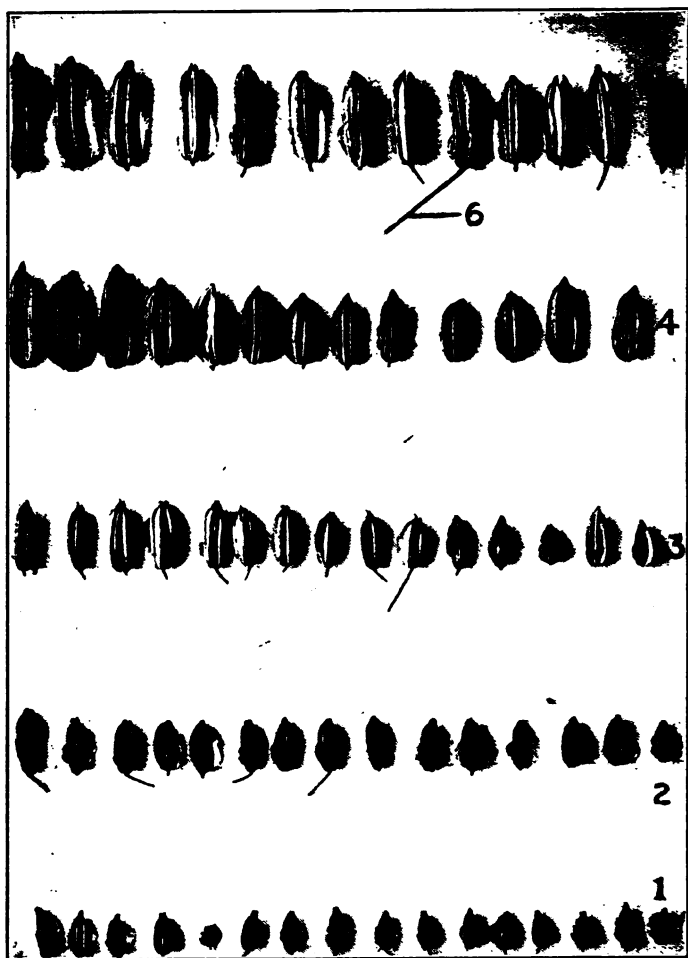
Description:

Cocculus indicus occurs as entire fruits. It is a berry. The outline is broadly reniform. The fruits measure 13 mm. or less in length and 10 mm. or less in width. The color varies from light gray to brownish black. The surface is rough and wrinkled. The convex surface has an indistinct ridge which extends from the circular stalk scar to the slightly beaked apex. This ridge appears as a narrow, fibrous band when the outer coat has been removed. The fruit is one-celled and one-seeded. The pericarp is fibrous. The seeds are yellowish gray and urn-shaped; on cross-sections they are crescent-shaped. The odor is not characteristic. The taste is bitter and oily.

Constituents: Fat, alkaloids (menispermine, paramenispermine), picrotoxin, cocculin, picrotoxic acid, etc.

Preparations:

Tinctura Cocculi Indici (for external use).



FENICULUM

1, Wild fennel (unofficial). 2, Russian fennel. 3, Levant fennel. 4, German fennel. 5, Spanish fennel. 6, Pedicle.

FOENICULUM (Fœnic.) U. S. P.

English name: Fennel.

Synonyms: Fennel Seed.

Botanical origin: *Fœniculum vulgare* Mille. (Fam. *Umbelliferae*.)

Part used: Ripe fruit.

Impurities: Not more than 4 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 9 per cent.

Habitat: Southern Europe and Asia; United States, New Jersey, south to Florida and Texas.

Description:

Fennel occurs as mericarps and cremocarps. Fennel is a *cremocarp*. The outline varies from elliptical to oblong-cylindrical. The cremocarps are 16 mm. or less in length, 6 mm. or less in width, and 3 mm. or less in thickness. The color varies from yellow to greenish brown. The dorsal surface has three strongly elevated ribs; the lateral surface has two ribs. The commissural surface is slightly grooved and has alternate bands of a light and dark color. The apex of each mericarp has slender stylopodium. The odor is aromatic. The taste is sweet and pungent.

Constituents: Volatile oil, fixed oil, sugar, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Aqua Fœniculi; Dose, 15 mls (4 fl. drs.).

Infusum Sennæ Compositum; Dose, 120 mls (4 fl. ozs.).

Oleum Fœniculi; Dose, 0.2 mls (3 min.).



CARUM

1, Fruits of variable size. 2, Several mericarps.

CARUM (Car.) U. S. P.

English name: Caraway.

Synonyms: Caraway Seed.

Botanical origin: *Carum Carvi* Linné. (Fam. *Umbelliferae*.)

Part used: Dried fruit.

Impurities: Not more than 3 per cent. of other fruits, seeds or foreign matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: North America, south to Pennsylvania and Colorado.

Description:

Caraway occurs as a mixture of entire mericarps and cremocarps. Caraway is a *cremocarp*. The *outline* of the cremocarps is oblong; it tapers toward either end and is laterally compressed. The mericarps are crescent-shaped. The mericarps measure 8 mm. or less in length and 2 mm. or less in diameter. The *color* varies from gray to purplish brown. The *outer curved surface* has five yellowish narrow ribs, between which are five indistinct ribs. The *commisural surface* has a light-colored ridge in the center parallel to its length. The mericarps are five-angled on cross-section. The layers are not distinguishable. The *odor* is aromatic. The *taste* is pungent.

Constituents: Fat, resin, gum, tannin, sugar, volatile oil, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Oleum Cari; Dose, 0.2 mil (3 min.).



ANGELICÆ FRUCTUS

1, European angelica. 2, Several mericarps showing the three large central ribs. 3, American angelica (*Angelica atropurpurea*).

ANGELICÆ FRUCTUS (Angel. Fruct.) N. F.

English name: Angelica Fruit.

Synonyms: European Angelica Seed.

Botanical origin: *Angelica Archangelica* Linné and of other species of *Angelica*. (Fam. *Umbelliferae*.)

Part used: Ripe fruit.

Impurities: Not more than 3 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Northern Europe.

Description:

Angelica fruit occurs as mericarps, rarely as cremocarps. Angelica is a cremocarp. The outline varies from oval to oblong. The cremocarps measure 6 mm. or less in width, 2.5 mm. or less in thickness, and 10 mm. or less in length. The color varies from greenish yellow to greenish brown. The dorsal surface has three large elevated ribs, the lateral surface two broad ribs. The commissural surface is grooved and the apex of the cremocarps has five minute calyx teeth. The base of each mericarp is slightly notched. The odor is strongly aromatic. The taste is tingling and very strongly pungent.

Constituents: Volatile oil, bitter principle, resin, etc.

Dose: 1 Gm. (15 grains).

Preparations:
None.



ANISUM

1, Italian aniseed in mass. 2, Several cremocarps and mericarps. 3, Russian aniseed. 4, Several cremocarps and mericarps.

ANISUM (Anis.) U. S. P.

English name: Anise.

Synonyms: Aniseed.

Botanical origin: *Pimpinella Anisum* Linné. (Fam. *Umbelliferae*.)

Part used: Ripe fruit, dried.

Impurities: Not more than 3 per cent. of foreign seeds or other vegetable matter.

Assay: None given.

Ash: Not more than 9 per cent.

Habitat: Asia, Europe, and Northern Africa.

Description:

Anise occurs as a mixture of entire cremocarps and mericarps attached to or separated from long pedicels. Anise is a *cremocarp*. The outline of the cremocarps and mericarps is ovate-lanceolate. The cremocarps measure 7 mm. or less in length and 3 mm. or less in width at the base. The Russian anise is uniformly shorter and broader than the Spanish variety. The color of the Italian, Spanish and Levant anise is grayish yellow, of the Russian anise dark grayish brown. The outer surface has five light yellow ribs. The apex is constricted and surmounted by a disk and a persistent style. The layers of the mericarp are not distinct. The odor is sweet aromatic. The taste is pungent.

Constituents: Volatile oil, fixed oil, sugar, resin, etc.

Dose: 0.5 Gm. (8 grains).

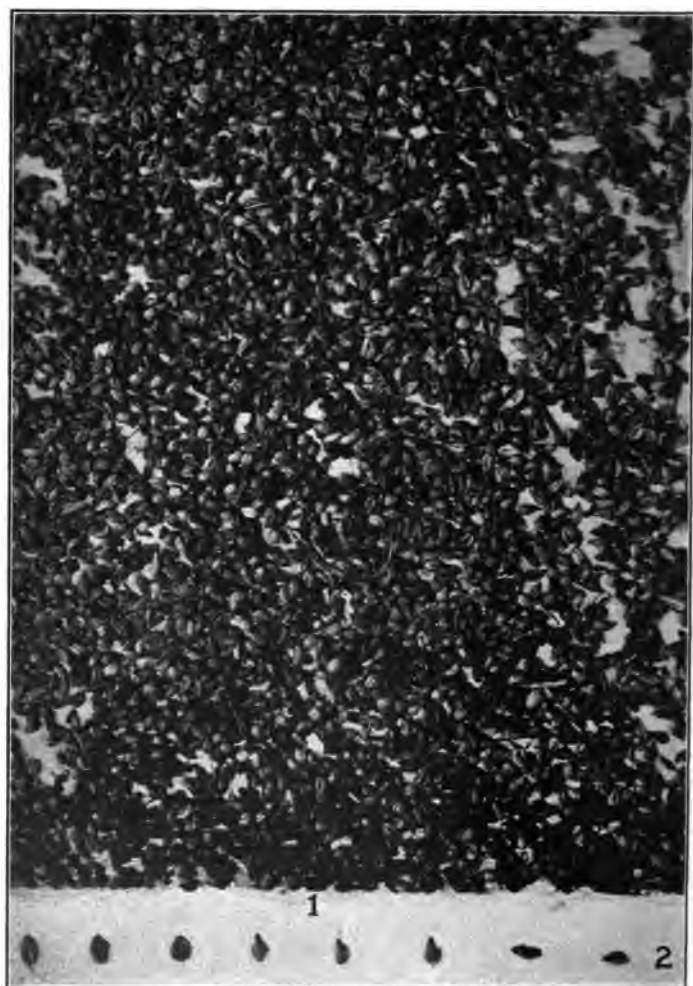
Preparations:

Aqua Anisi; Dose, 15 mls (4 fl. drs.).

Elixir Anisi N. F.; Dose (Infant's) 1 mil (15 min.).

Oleum Anisi; Dose, 0.2 mil (3 min.).

Spiritus Anisi (from Oil); Dose, 2 mls (30 min.).



PETROSELINUM

1, Numerous fruits. 2, Several cremocarps and mericarps.

PETROSELINUM (Petrosel.) U. S. P.

English name: Parsley Fruit.

Synonyms: Parsley Seed.

Botanical origin: *Petroselinum sativum* Hoffmann.
(Fam. *Umbelliferae*.)

Part used: Ripe fruit, dried.

Impurities: Not more than 5 per cent. of foreign seeds or other matter.

Assay: None given.

Ash: None given.

Habitat: Southern Europe; North America, Ontario south to North Carolina and Texas.

Description:

Parsley Fruit occurs as a mixture of entire mericarps and cremocarps. Parsley is a cremocarp. The outline of the cremocarps is ovate, of the mericarps curved and tapering. The mericarps measure 4 mm. or less in length and 2 mm. or less in diameter at the base. The color varies from yellow to greenish brown. The outer surface has five yellow narrow ribs, between which the surface is elevated and rounded. The commissural surface is slightly channeled. The odor is aromatic. The taste is pungent.

Constituents: Fixed oil and volatile oil containing apiol, tannin, resin, glucoside, etc.

Dose: None given.

Preparations:

Oleoresina Petroselini; Dose, 0.5 mil (8 min.).



CONIUM

1, Many fruits of variable size. 2, Several cremocarps.
3, Pedicel. 4, Small fruits.

CONIUM N. F.

English name: Conium.

Synonyms: Poison Hemlock.

Botanical origin: *Conium maculatum* Linné. (Fam. *Umbelliferae*.)

Part used: Unripe fruit.

Impurities: None given officially.

Assay: Not less than 0.5 per cent. of coniine. Unfit for use after being kept for more than two years.

Ash: Not more than 8 per cent.

Habitat: Europe, Asia, North America, south to Mexico.

Description:

Conium occurs as a mixture of entire mericarps and cremocarps. Conium is a cremocarp. The outline of the cremocarps is broadly ovate. The fruits measure 3 mm. or less in length and 3 mm. or less in diameter. The color varies from green to grayish brown. The outer convex surface of the mericarp has five light yellow wavy ribs, between which the surface is wrinkled. The commissural surface is concave and longitudinally grooved. Sections of the mericarps are angled. The layers must be studied microscopically. The odor is mouse-like when moistened with an alkali. The taste is slightly bitter and acrid.

Constituents: Alkaloids (coniine, conhydrine, etc.), fixed oil and volatile oil, etc.

Dose: 0.2 Gm. (3 grains).

Preparations:

Extractum Conii; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).
Fluidextractum Conii; Dose, 0.2 mil (3 min.).



API FRUCTUS

1, Numerous fruits. 2, Cremocarps. 3, Mericarp.

APII FRUCTUS (Apii Fruct.) N. F.

English name: Celery Fruit.

Synonyms: Celery Seed.

Botanical origin: *Apium graveolens* Linné. (Fam. *Umbelliferae*.)

Part used: Ripe fruit.

Impurities: Not more than 10 per cent. of foreign fruit or other matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Europe; widely cultivated.

Description:

Celery Fruit occurs as a mixture of entire mericarps and cremocarps. Celery is a *cremocarp*. The outline of the mericarps is nearly globular. The mericarps are curved, and when viewed from the outer surface they are ovate. The cremocarps measure 2 mm. or less in length and 2 mm. or less in diameter. The mericarps measure 1.5 mm. or less in length and 1 mm. or less in width. The color is dark brown. The outer surface has five light yellow ribs and is convex. The commissural surface is nearly flat and frequently has a slender stylopodium adhering to it. The layers of the mericarp are not distinguishable. The odor is aromatic. The taste is pungent.

Constituents: Volatile and fixed oils, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Fluidextractum Apii Fructus; Dose, 2 mls (30 min.).



CORIANDRUM

1, Small coriander. 2, Coriander of a normal size. 3, Indian coriander (not official).

CORIANDRUM (Coriand.) U. S. P.

English name: Coriander.

Synonyms: Coriander Seed.

Botanical origin: *Coriandrum sativum* Linné. (Fam. *Umbelliferae*.)

Part used: Ripe fruit.

Impurities: Not more than 5 per cent. of other fruits, seeds, or foreign matter.

Assay: Not less than 0.5 per cent. of ether-soluble volatile extractive.

Ash: Not more than 7 per cent.

Habitat: Asia; cultivated extensively.

Description:

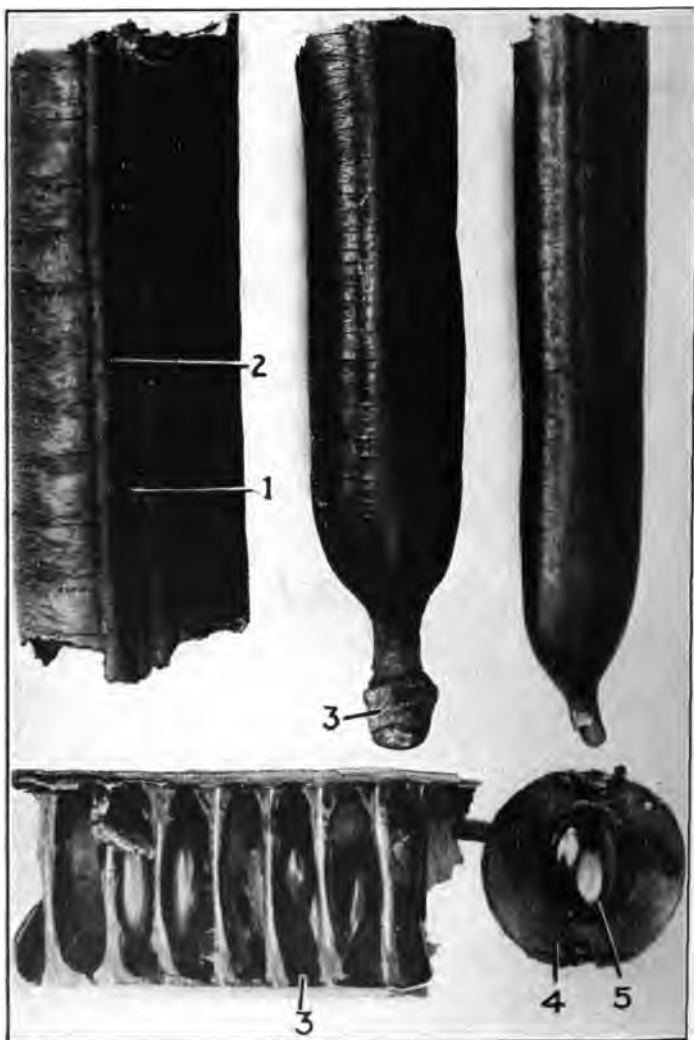
Coriander occurs as entire cremocarps. Coriander is a *cremocarp*. The *outline* of the cremocarps is globular. They measure up to 6 mm. in diameter. The *color* of the base is light yellowish brown, of the upper portion reddish purple. The *outer surface* of the mericarps has five thick, straight ribs and four slightly elevated, wavy ribs. The *apex* has a short stylopodium and five minute calyx teeth. The *commesural surface* is concave. The layers are not distinct. The *odor* is aromatic. The *taste* is pungent.

Constituents: Volatile and fixed oils, mucilage, malic acid, tannin, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Oleum Coriandri; Dose, 0.2 mil (3 min.).



CASSIA FISTULA

1, 2, Grooves and ridges on one side of the fruit. 3, Short stout pedicle. 3 (lower), Shows the cross partitions and several seeds. 4, Round disk (portion) covered with pulp. 5, Shiny seed.

CASSIA FISTULA (Cass. Fist.) N. F.

English name: Cassia Fistula.

Synonyms: Purging Cassia, Cassia Pods.

Botanical origin: *Cathartocarpus Fistula* (Linné)
Persoon. (Fam. Leguminosæ.)

Part used: Dried fruit.

Impurities: None given.

Assay: None given.

Ash: None given.

Habitat: East and West Indies, Africa and South America.

Description:

Cassia fistula occurs as a mixture of entire and broken fruits. It is a legume. The outline is oblong-cylindrical. The legumes measure 7 dm. or less in length and 21 mm. or less in diameter. The color varies from reddish brown to nearly black. The base of the capsule is constricted and is frequently attached to a portion of the short, stout pedicel. The apex is acute. The surface of one side of the legume has three grooves and two rounded ridges running parallel to its length. The opposite surface has two shallow grooves and one rounded parallel ridge. The curved surface is sunken and fissured. The legume is divided transversely into numerous compartments, each containing a hard, shiny, brownish black, flattened seed imbedded in a black, sweet pulp. The pericarp is fibrous. The odor is aromatic. The taste is sweet.

Constituents: Sugar, mucilage, pectin, tannin, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Syrupus Rhamni Cathartice; Dose, 8 mls (2 fl. drs.).



VANILLA

1, 2, 3, 4, 5, 6, Types of commercial vanilla beans. 7, Wild vanilla bean.

VANILLA N. F.

English name: Vanilla.

Synonyms: Vanilla Bean.

Botanical origin: *Vanilla planifolia* Andrews. (Fam. *Orchidaceæ*.)

Part used: Cured, full-grown, unripe fruit.

Impurities: None given officially.

Assay: Extractive yielded to dilute alcohol should not be less than 12 per cent.

Ash: Not more than 6 per cent.

Habitat: Eastern Mexico; cultivated extensively in tropics.

Description:

Vanilla occurs as entire fruits arranged in bundles and tied with thread. *Vanilla is a capsule.* The *outline* is linear; the narrowest portion is a curved or twisted base; from this point the pod expands, then narrows abruptly at the apex. The *fruits* measure 28 cm. or less in length and 10 mm. or less in diameter. The *color* varies from brownish black to black. The *surface* is smooth, moist, shiny and longitudinally furrowed; occasionally the surface has isolated brown cork patches and white crystals of vanillin. In some varieties the pods are split longitudinally and the surface is dry. The *epicarp* is thick and tough. The *sarcocarp* is soft and fleshy. The *endocarp* has placentæ with numerous seeds. The *seeds* are irregular in outline, brownish black and reticulate. The *odor* is aromatic. The *taste* is pungent.

Constituents: Vanillin, vanillic acid, balsam, resin, fixed oil, etc.

Preparations:

Tinctura Vanillæ (flavoring agent).



PAPAVERIS FRUCTUS

1, Yellowish white spotted placenta. 2, Persistent stigma disk. 3, Cross-section of a fruit.

PAPAVERIS FRUCTUS (Papav. Fruct.) N. F.

English name: Poppy Capsules.

Synonyms: Poppy Fruits.

Botanical origin: *Papaver somniferum* Linné. (Fam. *Papaveraceæ*.)

Part used: Unripe fruit, free of seeds.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 10 per cent.

Habitat: Western Asia; extensively cultivated in Asia, China, etc.

Description:

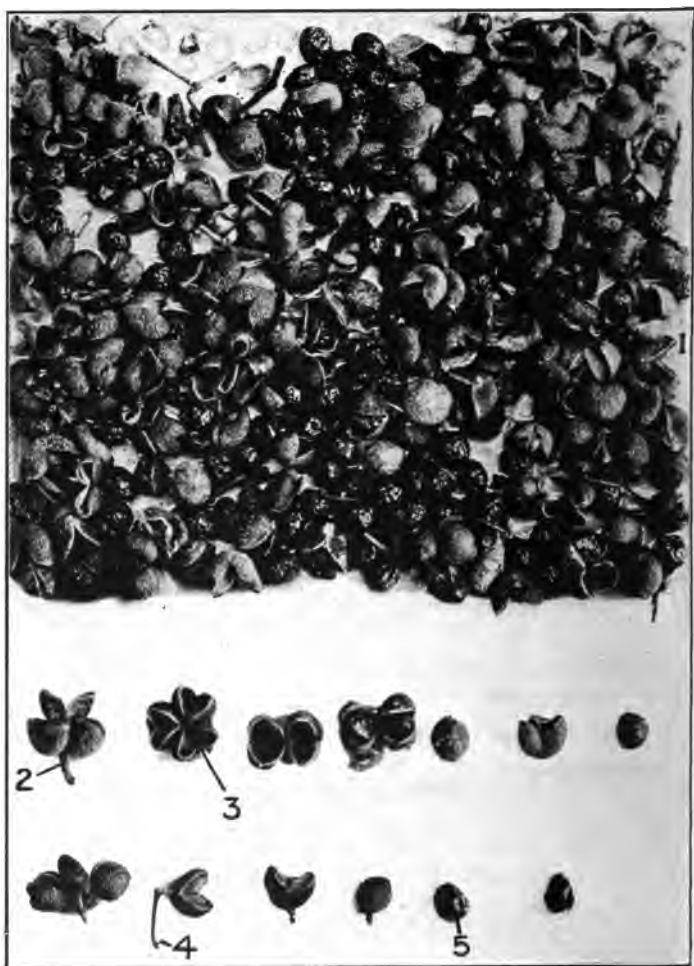
Poppy Capsules *occur* entire or crushed. Poppy fruits are *capsules*. The *base* is constricted and stem-like and is frequently united with a short, yellow, fibrous stalk. They have a maximum diameter of 6 cm. The *apex* has a persistent stigma disk with from seven to fifteen stigma rays. The *outline* varies from oval to globular. The *size* is variable. The *surface* is yellowish and has scattered black spots and as many longitudinal furrows as there are rays to the stigma. The *pericarp* is thick and grayish yellow. The *placentæ* are yellowish brown, dotted with numerous brown spots, which are the points of attachment of the seed to the placenta. The *seeds* must not be used. They are white, reniform and reticulate. The *odor* is not distinct. The *taste* is bitter.

Constituents: Small quantities of opium bases and other opium constituents.

Dose: 1 Gm. (15 grains).

Preparations:

Syrupus Papaveris; Dose, 4 mls (1 fl. dr.).



XANTHOXYLI FRUCTUS

1, Numerous fruits of southern prickly ash; the seeds are rough and pitted. 2, 3, Clusters of sessile foliicles of the southern variety. 4, Stalked capsules of the northern variety. 5, Smooth seed of the northern variety.

XANTHOXYLI FRUCTUS (Xanthox. Fruct.) N. F.

English name: Prickly Ash Berries.

Synonyms: None.

Botanical origin: *Xanthoxylum Clava-Herculis* Linné
and *Xanthoxylum americanum* Miller. (Fam.
Rutaceæ.)

Part used: Dried fruit.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Virginia to Arkansas, south to Florida and
Texas.

Description:

Prickly Ash Berries occur as a mixture of entire fruits with follicles, solitary or in clusters, and usually separated from the seeds. Prickly ash is a *follicle*. The *outline* of the capsules is globular to globose-oblong. They measure 8 mm. or less in length. The *color* varies from yellow to greenish brown. The *base* has a small scar and is sessile. The *apex* is usually split along both sides, and the split edges turn inward. The *outer surface* of the follicle is rough, and has numerous circular, depressed oil cavities. The *inner surface* of the follicle is smooth. The *seeds* are black, shiny and wrinkled. The outer layer of the seed is black; the inner layer brown, the central part hollow. The *odor* is aromatic. The *taste* is strongly pungent.

Constituents: Not investigated; probably same as of the bark.

Dose: 1 Gm. (15 grains).

Preparations:
None.



JUNIPERUS

1, Mass of fruits. 2, Triangular depression at the apex.
 3, Bracts at the base of the fruit. 4, Fruit cut to show
 the three seeds. 5, A seed. 6, A leaf.

JUNIPERUS (Junip.) N. F.

English name: Juniper Berries.

Synonyms: Horse Savin Berries.

Botanical origin: *Juniperus communis* Linné. (Fam. Pinaceæ.)

Part used: Ripe fruit.

Impurities: Old or insect-infected fruit, which should be rejected.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Europe, Asia, North America, south to Georgia and New Mexico.

Description:

Juniper Berries occur as entire fruits. Juniper is a *galbalus*. The outline varies from globular to subglobular. The fruits measure 1 cm. or less in diameter. The color varies from dark red to purple; frequently the surface has a grayish bloom. The base is attached to a short pedicle having six bracts. The apex has a triangular depression marking the line of union of the three scales forming the fruit. The surface is smooth, shiny, even or sunken. The outer layers of the fruit are greenish brown and spongy. The three seeds are three-sided and acute above, and are surrounded by the spongy outer layers of the fruit. The odor is aromatic. The taste is sweet and pungent.

Constituents: Volatile oil, resin, proteids, coloring matter, acids, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Juniperi; Dose, 4 mls (1 fl. dr.).

Oleum Juniperi U. S. P.; Dose, 0.2 mil (3 min.).

Spiritus Juniperi U. S. P.; Dose, 2 mls (30 min.).

Spiritus Juniperi Compositus U. S. P.; Dose, 10 mls (2 ½ fl. drs.).



HUMULUS

1, Three fruits of variable size. 2, Flexuous and hairy rachis. 3, Incurved margin of the bract inclosing a seed. 4, Fragments of the leaf.

HUMULUS (Humul.) U. S. P.

English name: Hops.

Synonyms: Lupulus.

Botanical origin: *Humulus Lupulus* Linné. (Fam. Moraceæ.)

Part used: Dried fruit.

Impurities: Not more than 2 per cent. of stems, leaves, or other foreign matter.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: Europe, Asia; extensively cultivated in eastern United States.

Description:

Hops occurs as a mixture of entire compressed and broken fruits. Hops is a *strobulus*. The outline varies from ovate to oblong-cylindrical. The fruits measure 5.8 cm. or less in length and 3 cm. or less in width. The color varies from yellowish green to yellowish brown. The bracts are imbricated in the fruit. The individual bracts are thin and papery; the veins are elevated, one margin is flat, and the other is incurved and encloses a rose-colored achene. The outline of the bracts varies from nearly rotund to oblong-ovate. The rachis is flexuous and hairy. The odor is aromatic. The taste is pungent and bitter.

Constituents: Volatile oil, resin, tannin, wax, choline, pectin, asparagin, etc.

Dose: 2 Gm. (30 grains).

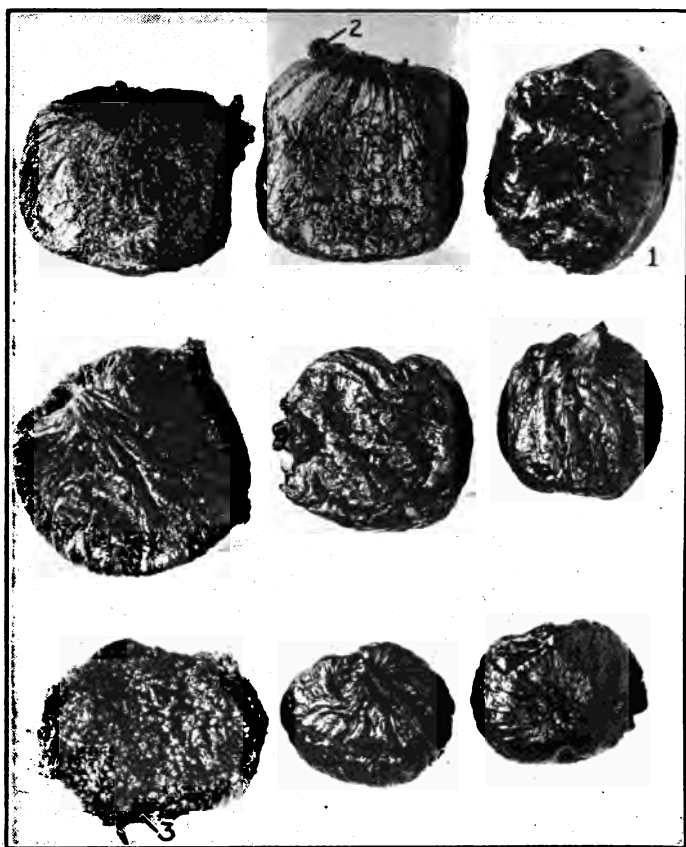
Preparations:

Elixir Humuli N. F.; Dose, 8 mls (2 fl. drs.).

Fluidextractum Humuli N. F.; Dose, 2 mls (30 min.).

Lupulinum; Dose, 0.5 Gm. (8 grains).

Tinctura Humuli; Dose, 4 mls (1 fl. dr.).



FICUS

1 and 2, Several figs. 3, Fig cut to show seeds.

FICUS N. F.

English name: Fig.

Synonyms: None.

Botanical origin: *Ficus Carica* Linné. (Fam. *Moraceæ*.)

Part used: Fruit, partially dried.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Western Asia; cultivated in California.

Description:

Figs occur as the compressed entire fruits. The fig is a *syconium*. The *outline* varies from globular to obovate. Figs measure 8 cm. or less in length and 6 cm. or less in width. The *color* varies from yellow to light brown. The *surface* is smooth, moist, or dry; if dry, the surface may be powdery with sugar. It is longitudinally striated and wrinkled. The *base* is constricted into a short, stalk-like portion. The outer layer of the *torus* is tough and pliable, the inner layer soft and sticky. The *inner surface* has numerous seeds. The *seeds* are shiny, yellowish brown achenes which measure 0.5 mm. or less in length. The *odor* of figs is aromatic. The *taste* is very sweet.

Constituents: Glucose, gum, fat, peptonizing ferment (cradin), etc.

Dose: None given.

Preparations:

Syrupus Ficorum Compositum; Dose, 4 mls (1 fl. dr.).



RUBI FRUCTUS

1. Several fruits. 2. Cross-section of a fruit. 3. Longitudinal section of a fruit.

RUBI FRUCTUS N. F.

English name: Blackberries.

Synonyms: High Bush Blackberries.

Botanical origin: *Rubus nigrobaccus* Bailey or *Rubus villosus* Aiton. (Fam. *Rosaceæ*.)

Part used: Ripe fruit.

Impurities: None given.

Assay: None given.

Ash: None given.

Habitat: Europe; cultivated in United States.

Description:

Fresh Blackberries occur in the entire condition. The blackberry is an *aggregate fruit*. The *outline* is oval or globose. The *berry* measures 25 mm. or less in length. The *drupelets* are numerous, black, and shining; they measure 5 mm. or less in diameter. The *pericarp* is smooth. The *mesocarp* is juicy; the juice is purplish red in color. The *endocarp* is black and hard, and encloses one seed. The *torus* is fleshy and elongated. In cross-sections it is nearly cylindrical. The *odor* is slight. The *taste* is sweet.

Dose: None given officially.

Preparations:

Cordiale Rubi Fructus; Dose 8 mls (2 fl. drs.).
Syrupus Rubi Fructus (flavoring agent).



RUBI IDÆI FRUCTUS

1, Mass of fruits. 2, Outer surface of the fruit. 3, Under surface. 4, Longitudinal section.

RUBI IDÆI FRUCTUS N. F.

English name: Raspberries.

Synonyms: Red Raspberries.

Botanical origin: *Rubus Idæus* Linné or *Rubus strigosus* Michaux. (Fam. *Rosaceæ*.)

Part used: Fresh ripe fruit.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: Cultivated in United States.

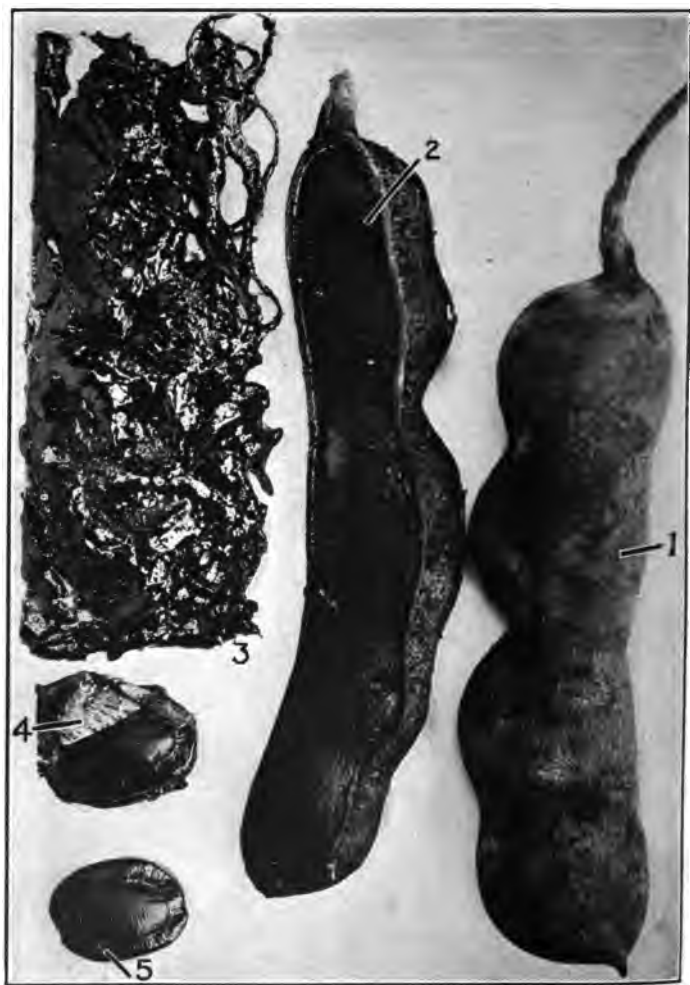
Description:

Raspberries occur in the entire condition. The fruit is aggregate. The outline is elongated-hemispheric. It measures 2 cm. or less in length. The drupelets are numerous and light red, and measure 4 mm. or less in length. The pericarps are hairy. The mesocarp is juicy; the juice is red in color. The endocarp is bony and encloses one seed. The inner surface of the fruit is hollow. The odor is aromatic. The taste is sweet.

Constituents: Malic and citric acids, sugar, coloring matter, etc.

Preparations:

Syrupus Rubi Idæi (flavoring agent).



TAMARINDUS

- 1, Entire fruit. 2, Fruit with the pericarp removed. 3, Mass of pulp. 4, Membrane which incloses the seed. 5, Seed.

TAMARINDUS (Tamarind.) N. F.

English name: Tamarind.

Synonyms: Tamarind Pulp.

Botanical origin: *Tamarindus indica* Linné. (Fam. Leguminosæ.)

Part used: Preserved pulp of the fruit.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: India, Africa, and West Indies.

Description:

Tamarind occurs as a mass of fibers, pulp and seed. Tamarind is a *capsule*. When entire the *outline* is oblong and constricted transversely. When the pericarp is removed the pulp is reddish brown and the fibrous strands are distinct. In the commercial drug this portion is crushed and pressed into cakes or irregular masses. The crushed portion consists of fibers, pulp and seeds. The *fibers* are yellowish brown and tough. The *pulp* is reddish brown and soft. The seeds are compressed, reddish brown and shiny, and the convex central part is surrounded by a nearly flat marginal portion. The membrane which usually encloses the seed is yellowish and tough. The *odor* is aromatic. The *taste* is sweet and sour.

Constituents: Citric, tartaric and malic acids, potassium bitartrate, sugar, pectin, etc.

Dose: 15 Gm. (4 drachms).

Preparations:

None.

SUCCUS CITRI (Suc. Cit.) N. F.

English name: Lime Juice.

Synonyms: None.

Botanical origin: *Citrus medica acida* (Roxburgh)
Bonavia. (Fam. *Rutaceæ*.)

Part used: Expressed juice of the ripe fruit.

Impurities: None officially mentioned.

Assay: 100 mls (Cc.) contains 5 to 10 Gm. of total
acids calculated as crystallized citric acid.

Ash: None officially stated.

Description:

Clear to slightly turbid *liquid*, of yellowish green color, aromatic
odor and acid *taste*. Specific gravity 1.025 to 1.040 at 25° C.

Constituents: Citric acid, etc.

Dose: None stated officially.

Preparations:

Succus Citri et Pepsinum; Dose, 8 mls (2 fl. drs.).

SUCCUS POMORUM (Suc. Pomor.) N. F.

English name: Fresh Apple Juice.

Synonyms: Fresh Cider.

Botanical origin: *Pyrus Malus* Linné. (Fam. *Rosaceæ*.)

Part used: Juice of sound, ripe, sour apples.

Impurities: None.

Assay: None given.

Ash: None mentioned.

Description:

Well known to all.

Constituents: Malic acid, etc.

Dose: None given.

Preparations:

Enters into Extractum Ferri Pomati.

CHAPTER XIV

SEEDS

IN the study of seeds the following must be considered: Occurrence, class, outline, size, color, surface, cross-section, odor and taste.

1. **Occurrence.** Seeds occur in the entire condition (usual condition), as in calabar bean, or broken, as in strophanthus, or crushed and molded into sticks, as in guarana, or as separated parts of seed, as in kola and mace.

2. **Class.** This refers to whether the embryo (young plant) comprises the entire seed with the exception of the outer protective layers, in which case it is said to be *exalbuminous*, or whether the embryo only partially fills the space within the seed coats, the remaining space being occupied by stored food. Seeds having an embryo surrounded by stored food are said to be *albuminous*. All seeds, then, are either exalbuminous or albuminous. In the present volume the seeds are divided into these two classes: (1) Albuminous and (2) Exalbuminous Seeds.

Nux vomica seed is a typical albuminous seed. The embryo is here shown surrounded by the stored food.

Physostigma is a typical exalbuminous seed. The embryo completely fills the space within the seed coats.

3. **Outline.** The outlines of seeds vary greatly. In most cases the outline is made up of curved surfaces, as in nutmeg, or of plane surfaces, as in staphisagria, or of plane and curved surfaces, as in coffee.

The characteristic outline of each seed is given in the description.

4. **Size.** The length varies from 38 mm., as in physostigma, to less than a millimeter, as in the smaller seeds of black mustard. The width varies from 30 mm., as in nux vomica, to less than a milli-

meter, as in black mustard. The thickness varies from 24 mm., as in Penang nutmeg, to less than one-half a millimeter, as in the tips of brown strophanthus.

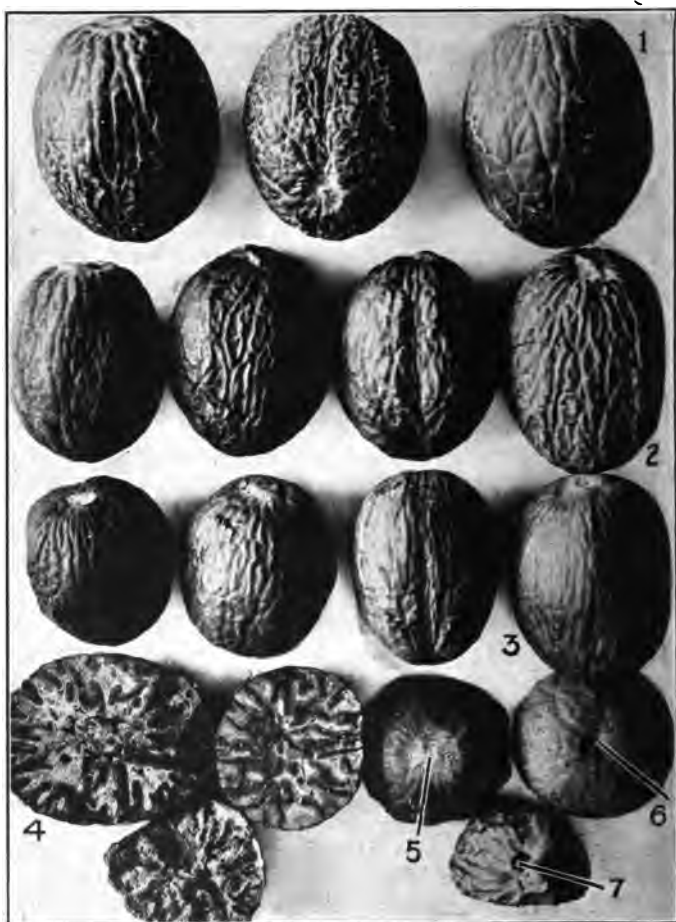
5. **Color.** The colors of the different seeds are characteristic for each seed. Grays, yellows, browns and blacks are the most common colors.

6. **Surface.** The surface of brown mustard is finely reticulate; of staphisagria, coarsely reticulate; of nutmeg, furrowed; of coffee, grooved on the flat side; of delphinium, winged. In addition the surface is hairy, as in nux vomica, brown and green strophanthus, sweet almond and in some varieties of pumpkin seed. Or the surface may be glabrous (free of hairs), as in calabar bean, yellow and brown mustard, coffee, colchicum seed, linseed and cardamom seed.

7. **Cross-section.** The cross-section of nutmeg is mottled; of coffee, folded; of calabar bean, hollow; in colchicum and most seeds it is solid.

8. **Odor.** The odor of nutmegs, cardamom, coffee and mace is strongly aromatic. Strophanthus, pumpkin and sweet almonds are slightly aromatic. White and black mustard are aromatic when moistened. Nux vomica, ignatia, staphisagria, delphinium, colchicum, linseed and physostigma have no characteristic odor.

9. **Taste.** The taste of nutmeg, cardamom and mace is pungent; of white and black mustard pungent when moist. Sweet almond and linseed are sweet. Kola is astringent. Nux vomica, ignatia, brown and green strophanthus are strongly bitter. Guarana is bitter and astringent. Staphisagria, delphinium and colchicum seed are bitter and acrid. Kola is astringent and physostigma is acrid.



MYRISTICA

1, Penang nutmegs. 2, Round West India nutmegs. 3, Banda nutmegs. 4, Longitudinal, cross and a broken surface of the seed. 5, Upper part of the seed. 6, Base of the seed. 7, Wormy seed.

MYRISTICA (Myrist.) U. S. P.

English name: Myristica.

Synonyms: Nutmeg, Round Nutmeg.

Botanical origin: *Myristica fragrans* Houttuyn.
(Fam. *Myristicaceæ*.)

Part used: Ripe seeds.

Impurities: Reject broken or wormy kernels.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Molucca Islands; cultivated in tropical countries.

Description:

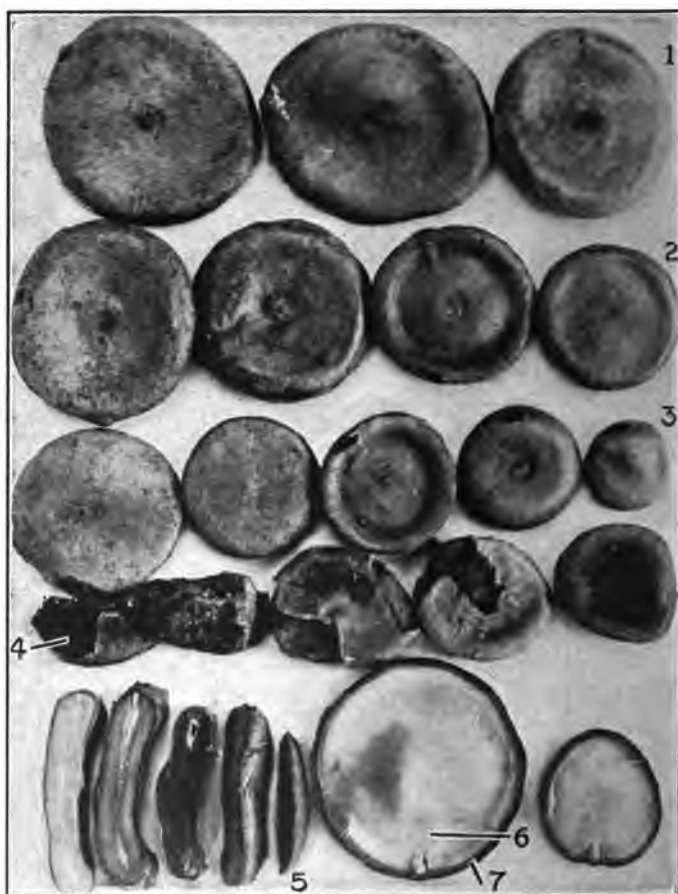
Myristica occurs as entire seeds. Nutmeg is an albuminous seed. The base of the seed is sunken and has a slightly convex gray scar dotted with brown. The apex is rounded, and at one side has a circular, sunken brown scar. The outline varies from globular to oval to ellipsoidal. The size of the different varieties of nutmegs differs. The Padang and West Indian nutmegs measure 21 mm. or less in width and 26 mm. or less in length. Banda nutmegs measure 28 mm. or less in length and 21 mm. or less in width. Penang nutmegs measure 30 mm. or less in length and 24 mm. or less in diameter. The color of nutmegs varies from grayish brown to purple. The surface is furrowed and deeply grooved along one side. Cross-sections have a mottled surface. This condition is caused by reddish brown radial lines and by yellow and gray areas. The odor is aromatic. The taste is strongly pungent.

Constituents: Volatile and fixed oils, proteids, gum, starch, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Oleum Myristicæ; Dose, 0.2 mil (3 min.).



NUX VOMICA

1, Ceylon nux vomica. 2, Bombay seeds. 3, Singapore seeds. 4, Nux vomica sorts. 5, Cross-sections of the seed. 6, Embryo. 7, Outer layer.

NUX VOMICA (Nux. Vom.) U. S. P.

English name: Nux Vomica.

Synonyms: Dog Buttons, Quaker Buttons, Strychni semen P. I.

Botanical origin: *Strychnos Nux-vomica* Linné. (Fam. *Loganiaceæ*.)

Part used: Ripe seed.

Impurities: None given in U. S. P.

Assay: Not less than 2.5 per cent. of alkaloids.

Ash: Not more than 3.5 per cent.

Habitat: India, East India and China.

Description:

Nux vomica occurs as entire, rarely as broken, seeds. *Nux vomica* is an albuminous seed. The outline varies from lenticular to oblong. *Nux vomica* has a maximum width of 30 mm. and a maximum thickness of 6 mm. The texture is bony. The color varies from gray to yellowish gray or green. The surface is smooth and shiny because of appressed hairs; on both of the flat sides there are ridges (raphes) which extend from about the center to the edge. *Nux vomica* has no fracture. When cut parallel to the flat surfaces the perisperm is separated into two parts and the small embryo with thin yellowish white cotyledons is distinct. The odor is not distinct. The taste is very strong and persistently bitter.

Constituents: Alkaloids (strychnine, brucine), fixed oil, proteids, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

Extractum Nucis Vomice; Dose, 0.015 Gm. ($\frac{1}{4}$ grain).
Fluidextractum Nucis Vomice; Dose, 0.05 mil (1 min.).
Tinctura Nucis Vomice; Dose, 0.5 mil (8 min.).



IGNATIA

1, 2, Numerous seeds. 3, Depressed stem scar. 4, Broken surface.

IGNATIA (Ignat.) N. F.

English name: Ignatia.

Synonyms: St. Ignatius Bean, Ignatia Amara.

Botanical origin: *Strychnos Ignatii* Bergius. (Fam. *Loganiaceæ*.)

Part used: Ripe seed.

Impurities: None given officially.

Assay: Not less than 2 per cent. of alkaloids.

Ash: Not more than 4 per cent.

Habitat: Philippine Islands and parts of China.

Description:

Ignatia occurs as entire seeds. Ignatia is an albuminous seed. The *base* of the seed is oblique, rounded or concave, and it has a circular, depressed scar. The *apex* is rounded or truncate. The *outline* varies from rotund to oval to oblong to triangular, etc. Ignatia measures 31 mm. or less in length and 20 mm. or less in width. The *color* varies from gray to brownish black. The *surface* is dull, rough and concavo-convex; the broken surface is grayish yellow and waxy. The *odor* is not characteristic. The *taste* is very strongly bitter.

Constituents: Alkaloids (strychnine, brucine), etc., like nux vomica.

Dose: 0.06 Gm. (1 grain).

Preparations:

Extractum Ignatiæ; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).
Tinctura Ignatiæ; Dose, 0.6 mil (10 min.).



COFFEA TOSTA

1, Several seeds of Arabian coffee. 2, Seeds of Arabian coffee of variable size. 3, Liberian coffee. 4, Liberian coffee of variable size. 5, Grooved surface.

COFFEA TOSTA (Coff. Tost.) N. F.

English name: Coffee.

Synonyms: Roasted Coffee.

Botanical origin: *Coffea arabica* Linné or *Coffea liberica* Bulliard. (Fam. *Rubiaceæ*.)

Part used: Ripe seed roasted until it develops a dark-brown color and a characteristic aroma.

Impurities: None given officially.

Assay: Not less than 1 per cent. of caffeine.

Ash: Not less than 3 per cent. nor more than 5 per cent.

Habitat: Africa; cultivated in tropical countries (Mocha, Java, Ceylon and Brazil).

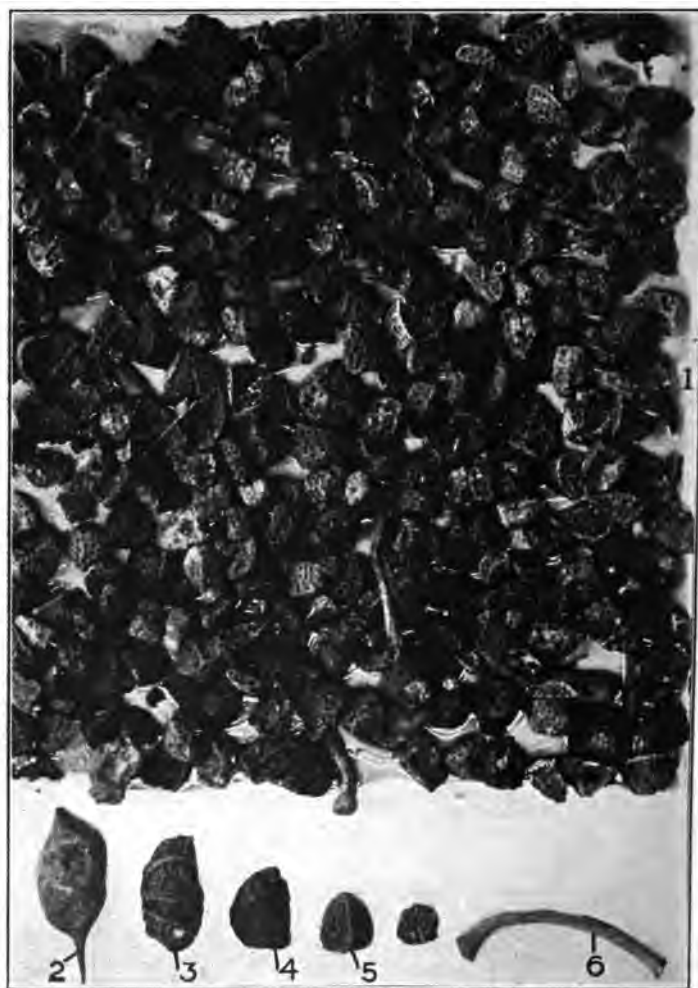
Description:

Coffee occurs as entire seeds. Coffee is an albuminous seed. The outline varies from rotund to oval to oblong. The *arabica* variety measures 11 mm. or less in length and 9 mm. or less in width. The *liberica* variety measures 16 mm. or less in length and 12 mm. or less in diameter. The color is yellowish brown. The surface is convex on one side and flat and grooved on the opposite side. The grooved portion is frequently a fragment of the seed coat. On cross-sections the perisperm is in two parts and it is folded and rolled inward. The odor is aromatic. The taste is bitter.

Constituents: Caffeine, caffeeo-tannic acid; caffeeol, sugar, dextrin, fat, proteids, volatile oil, etc.

Preparations:

Fluidextractum Coffeæ; Dose, 2 mls (30 min.).



STAPHISAGRIA

1, Numerous fruits. 2, 3, Fruit with several seeds. 4, Seeds without the pericarp. 5, Single seed. 6, Stem.

STAPHISAGRIA (Staphisag.) U. S. P.

English name: Staphisagria.

Synonyms: Stavesacre.

Botanical origin: *Delphinium Staphisagria* Linné.
(Fam. *Ranunculaceæ*.)

Part used: Ripe seeds.

Impurities: Not more than 2 per cent. of foreign vegetable matter.

Assay: None given.

Ash: None given.

Habitat: Mediterranean Region; cultivated.

Description:

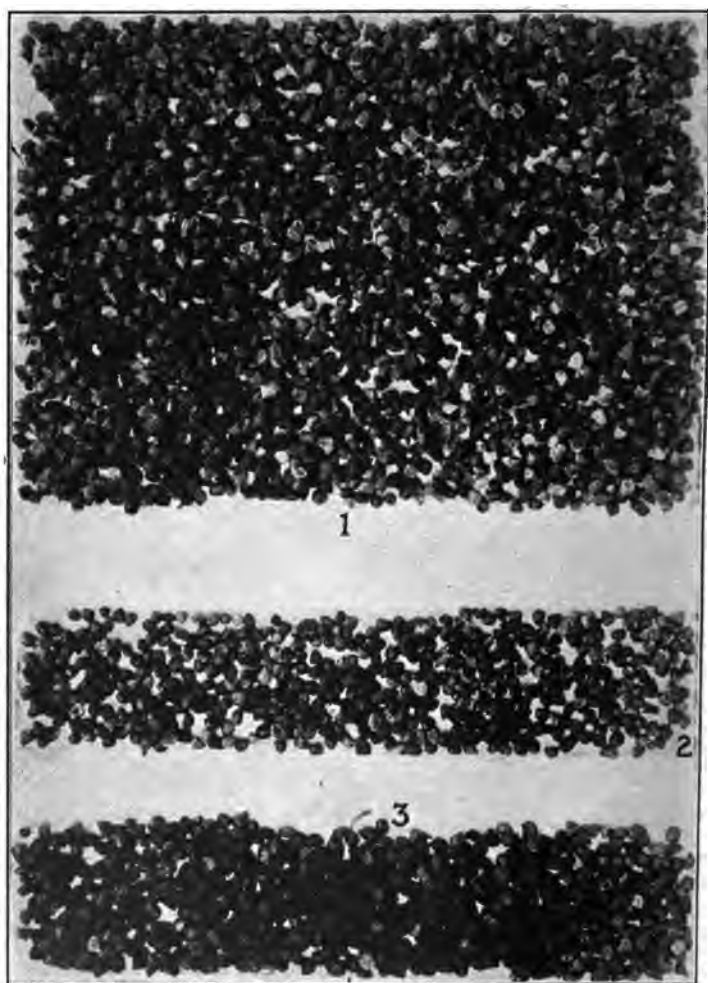
Staphisagria occurs as solitary or grouped entire seeds. Stavesacre is an albuminous seed. The *outline* is variable. One surface is curved, the others plane and angled. One end is tapering or acute, the opposite rounded or truncate. The *seeds* measure 10 mm. or less in length and 8 mm. or less in width. The *color* varies from gray to yellow to brown. The *surface* is coarsely reticulate. The *testa* is thick. The *perisperm* is bluish gray. The *odor* is not distinct. The *taste* is bitter and acrid.

Constituents: Fixed oil, volatile oil, resins, alkaloids (delphinine, delphinoidine, staphisagrine, etc.), proteids, malic acid, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

Fluidextractum *Staphisagriae*. (Used externally.)



DELPHINIUM

1, Field larkspur. 2, 3, Garden larkspur (*Delphinium Ajacis*).

DELPHINIUM (Delphin.) N. F.

English name: Larkspur Seed.

Synonyms: Field Larkspur, Staggerweed, Knight's-spur.

Botanical origin: *Delphinium Consolida* Linné, *Delphinium Ajacis* Linné. (Fam. Ranunculaceæ.)

Part used: Dried seeds.

Impurities: Not more than 5 per cent. of foreign matter.

Assay: None given.

Ash: Not more than 7 per cent.

Habitat: Europe; naturalized in the United States, New Jersey south to Florida, west to Kansas.

Description:

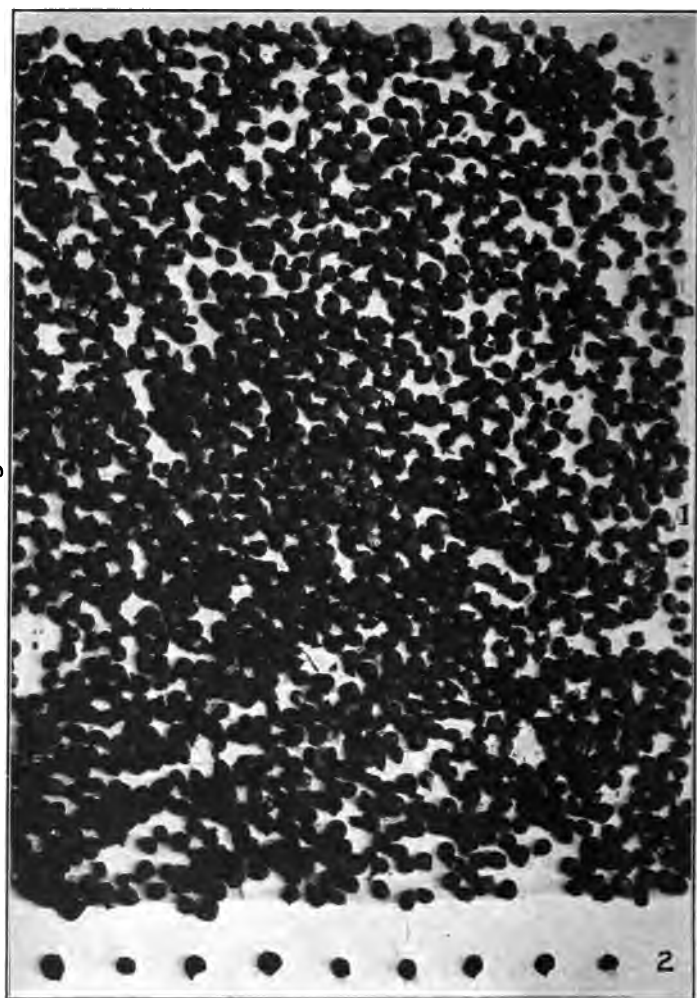
Larkspur Seed occurs as entire seeds. It is an albuminous seed. The base is broad and has a circular, depressed scar. The apex is acute. The outline is angularly conical, usually four-sided. The size is variable. The giant ajacis species measure 2 mm. or less in length and 2 mm. or less in width. The dwarf ajacis species measure 1.5 mm. or less in length and 1 mm. or less in width. The consolida species measure 3 mm. or less in length and 2 mm. or less in width. The color of the giant ajacis seeds is dark brownish black, of the dwarf ajacis seeds and consolida seeds the color varies from gray to brown to black. The surface of all varieties is prominently and transversely winged. The outer layer of the seed is dark, the inner layer bluish gray. The odor is not distinct. The taste is bitter.

Constituents: Alkaloids, volatile and fixed oils, gum, resin, gallic acid, etc.

Dose: Not used internally.

Preparations:

Tinctura Delphinii. (Used externally.)



COLCHICI SEMEN

1, Numerous seeds. 2, Seeds of variable size.

COLCHICI SEMEN (Colch. Sem.) U. S. P.

English name: Colchicum Seed.

Synonyms: Colchici semen P. I.

Botanical origin: *Colchicum autumnale* Linné. (Fam. *Liliaceæ*.)

Part used: Dried seeds.

Impurities: None given in U. S. P.

Assay: Not less than 0.45 per cent. of colchicine.

Ash: Not more than 8 per cent.

Habitat: Central and Southern Europe and Africa.

Description:

Colchicum Seeds occur as entire seeds. Colchicum seed is albuminous. The base is pointed and grayish white. The apex is rounded. The outline varies from globular to subglobular. The seeds measure 3 mm. or less in length and 2.5 mm. or less in width. The color varies from yellowish brown to brownish black. The surface is dull and granular in appearance. Sections of the seed have a thin, dark outer layer, and a gray, hard, bony inner layer. The odor is not characteristic. The taste is bitter and acrid.

Constituents: Colchicine, fixed oil, starch, tannin, resin, etc.

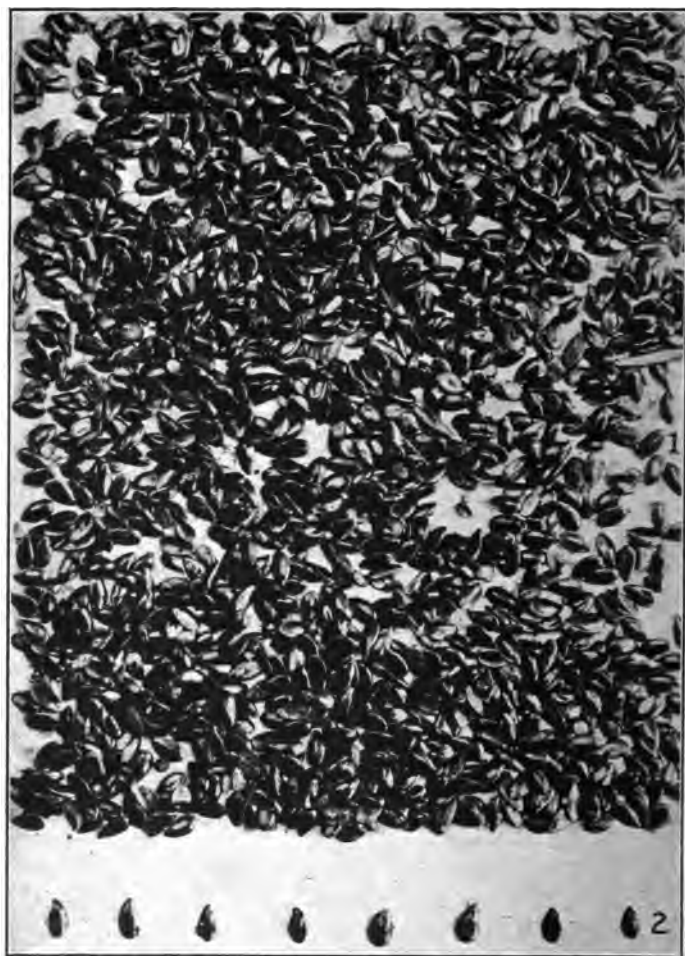
Dose: 0.2 Gm. (3 grains).

Preparations:

Fluidextractum Colchici Seminis; Dose, 0.2 mil (3 min.).

Tinctura Colchici Seminis; Dose, 2 mils (30 min.).

Vinum Colchici Seminis N. F.; Dose, 0.6 mil (10 min.).



LINUM

1, Mass of seeds. 2, Seeds of different form and size.

LINUM U. S. P.

English name: Linseed.

Synonyms: Flaxseed.

Botanical origin: *Linum usitatissimum* Linné. (Fam. *Linaceæ*.)

Part used: Ripe seeds.

Impurities: Not more than 3 per cent. of other seeds or other foreign matter.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: Russia, Canada and United States; cultivated in almost all temperate regions.

Description:

Linseed occurs as entire seeds. Linseed is an exalbuminous seed. The *base* is round. The *margin* is rounded on one edge and acute on the other. The *apex* is acuminate on one side and constricted on the other; this gives the seed a beaked appearance. The *outline* is ovate-lanceolate. The *color* varies from yellowish to reddish brown. The *surface* is smooth; the acute edge is yellowish. The *testa* is brown and thick. The *perisperm* and *cotyledons* are yellowish green. The *odor* is slight. The *taste* is slightly sweet, mucilaginous and oily.

Constituents: Fixed oil, mucilage, proteids, resin, tannin, etc.

Dose: None given.

Preparations:

Oleum, Lini; Dose, 30 mils (1 fl. oz.).



STROPHANTHUS (GREEN) .

1, Numerous seeds. 2, Seeds of variable form and size.

STROPHANTHUS (Strophanth.) U. S. P.

(1) Green Strophanthus

English name: Strophanthus.

Synonyms: Green Strophanthus.

Botanical origin: *Strophanthus Kombé* Oliver. (Fam. *Apocynaceæ.*)

Part used: Ripe seeds, deprived of the long awns.

Impurities: None given in U. S. P.

Assay (Biological): If made into the official tincture the minimum lethal dose should not be greater than 0.00006 mil of tincture for each Gm. of weight of frog.

Ash: Not more than 5 per cent.

Habitat: Tropical Africa.

Description:

Green *Strophanthus* occurs as entire compressed seeds. *Strophanthus* is an exalbuminous seed. The *base* is rounded or slightly tapering. The *margin* is entire. The *apex* is tapering, blunt, rounded, or acuminate. The *outline* varies from oval to oblong to oblong-lanceolate. The seeds measure 22 mm. or less in length and 7 mm. or less in width and 3 mm. or less in thickness. The *color* is grayish green. The *surface* is densely hairy and one of the flat surfaces is ridged. The *testa* is thin and brittle. The *endosperm* and *embryo* are white. The *odor* is distinct. The *taste* is very strongly bitter.

Constituents: Strophanthin (glucoside), fixed oil, choline, starch, proteids, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

Tinctura Strophanthi; Dose, 0.5 mil (8 min.).



STROPHANTHUS (BROWN)

1, Mass of seeds. 2, Slender apex of seed. 3, Small seed.

STROPHANTHUS (Strophanth.) U. S. P.

(2) Brown Strophanthus

English name: Strophanthus.

Synonyms: Brown Strophanthus.

Botanical origin: *Strophanthus hispidus* De Candolle.
(Fam. *Apocynaceæ*.)

Part used: Ripe seeds, deprived of the long awns.

Impurities: None given in U. S. P.

Assay (Biological): If made into the official tincture the minimum lethal dose should not be greater than 0.00006 mil of tincture for each Gm. of weight of frog.

Ash: Not more than 5 per cent.

Habitat: Tropical Africa.

Description:

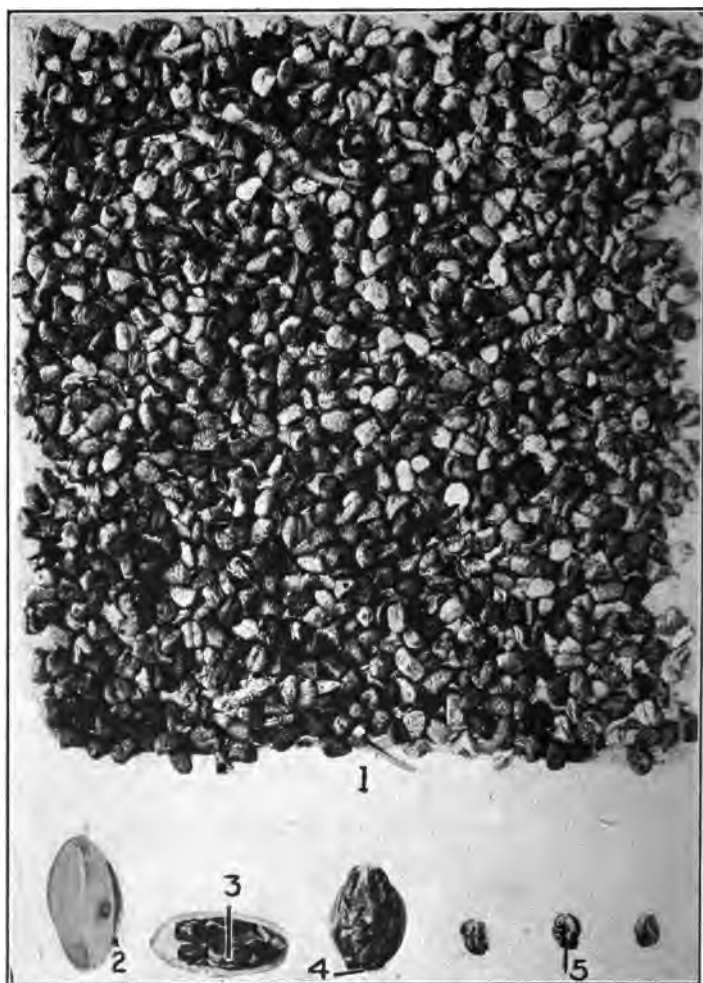
Brown Strophanthus occurs as entire compressed seeds. Brown strophanthus is an exalbuminous seed. The base is blunt, rounded, or tapering. The apex is narrowly acuminate. The outline varies from oblong-lanceolate to ovate-lanceolate. The seeds measure 18 mm. or less in length and 4 mm. or less in width and 2 mm. or less in thickness. The color varies from light to dark brown. The surface is partially or completely hairy, and one of the flat surfaces is ridged. The testa is thin and brittle. The endosperm and embryo are grayish white. The odor is slight. The taste is very strongly bitter.

Constituents: Strophanthin (glucoside), fixed oil, choline, starch, proteids, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

Tinctura Strophanthi; Dose, 0.5 mil' (8 min.).



CARDAMOMI SEMEN

1, Mass of seeds. 2, Fruit with seed. 3, Fruit cut to show seed. 4, Capsule containing fruit. 5, Groove on one side of the seed.

CARDAMOMI SEMEN (Cardam. Sem.) U. S. P.

English name: Cardamom Seed.

Synonyms: Cardamom.

Botanical origin: *Elettaria Cardamomum* White et Maton. (Fam. *Zingiberaceæ*.)

Part used: Dried seeds recently removed from capsules.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 8 per cent.

Habitat: India; cultivated in Ceylon.

Description:

Cardamom Seed *occurs* as entire seeds. It is an albuminous seed. The *base* has a circular, depressed scar. The *apex* is rounded. The *outline* is irregular, three- to four-sided. The seeds measure 5 mm. or less in length and 3 mm. or less in diameter. The *color* varies from gray to yellow to brown. The *surface* is deeply grooved on one side, the remaining part irregularly, transversely furrowed and tuberculated. *Cross-sections* have a brown outer layer and a white inner layer and a small reniform cavity with a small embryo. The *odor* is aromatic. The *taste* is pungent.

Constituents: Fixed and volatile oils, resin, starch, albuminoids, gum, manganese compounds, etc.

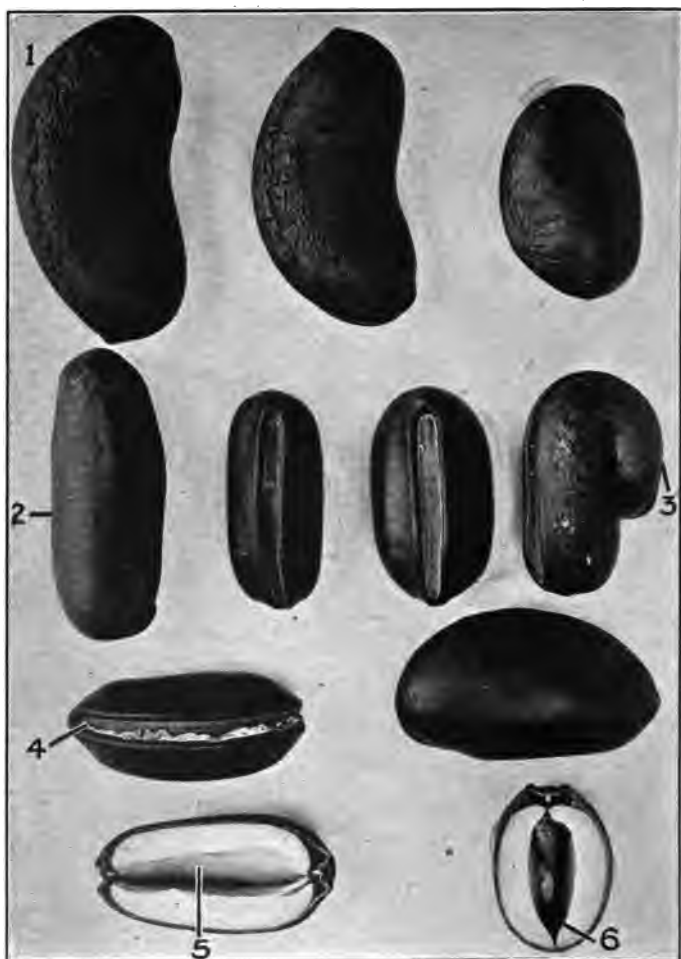
Dose: 1 Gm. (15 grains).

Preparations:

Spiritus Cardamomi Compositus N. F. (Flavoring agent.)

Tinctura Cardamomi; Dose, 2 mils (30 min.).

Tinctura Cardamomi Composita; Dose, 4 mils (1 fl. dr.).



PHYSOSTIGMA

1, Side view of seed showing the reniform outline. 2, Nearly straight seed. 3, Young curved seed. 4, Groove with remains of white funiculus. 5, Longitudinal section of the seed. 6, Cross-section of the seed.

PHYSOSTIGMA (Physostig.) U. S. P. . .

English name: Physostigma.

Synonyms: Calabar Bean, Ordeal Bean.

Botanical origin: *Physostigma venenosum* Balfour.
(Fam. *Leguminosæ*.)

Part used: Dried ripe seed.

Impurities: None given in U. S. P.

Assay: Not less than 0.15 per cent. of alkaloids.

Ash: Not more than 3 per cent.

Habitat: Southern Africa; cultivated.

Description:

Physostigma occurs as entire straight, rarely as folded, seeds. Calabar bean is an exalbuminous seed. The *base* is rounded. The *margin* is grooved on the convex side and is entire on the concave, the plane, or the slightly convex side opposite to the groove. The *apex* is grooved and rounded. The *outline* varies from elliptical to oblong to broadly reniform. Calabar bean measures 38 mm. or less in length and 20 mm. or less in width. The *color* varies from reddish brown to nearly black. The *surface* is shiny and rough. The convex side is deeply grooved and the apex is grooved. The margins of the groove are rounded and reddish brown. The bottom of the groove is black, and frequently has portions of the white funiculus adhering to it. *Longitudinal* and *cross sections* have a thick testa and two white cotyledons surrounding a central cavity. The *odor* is not distinct. The *taste* is acrid.

Constituents: Alkaloids (physostigmine, calabarine, etc.), physosterin, starch, proteids, gum, fat, etc.

Dose: 0.1 Gm. (1½ grains).

Preparations:

Extractum Physostigmatidis; Dose, 0.008 Gm. (¼ grain).

Tinctura Physostigmatidis; Dose, 1 mil (15 min.).



AMYGDALA DULCIS

1, Oblong almonds. 2, Inequilateral seeds. 3, Short broad seeds. 4, Longitudinal section showing small embryo. 5, Cross-section of seed showing the space between the cotyledons.

AMYGDALA DULCIS (Amygd. Dulc.) U. S. P.

English name: Sweet Almond.

Synonyms: None.

Botanical origin: *Prunus Amygdalus dulcis* De Candolle. (Fam. *Rosaceæ*.)

Part used: Ripe seeds.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 4 per cent.

Habitat: Mediterranean Basin; cultivated in California.

Description:

Sweet Almond occurs as entire seeds. It is an exalbuminous seed. The base of the seed varies from blunt to rounded to inequilateral, and has a depressed scar. The margin curves to the apex, or one side is curved and the other nearly straight. The apex is acute-pointed. The outline varies from ovate to oblong. The seeds measure 4 cm. or less in length and 2 mm. or less in width. The color varies from yellowish to reddish brown. The surface is coarsely furrowed, and hairy cross-sections show a thin testa and a space at the center between the two cotyledons. The cotyledons when separated longitudinally have a white embryo, and on the opposite cotyledon is a cavity formed by the embryo. The odor is slight. The taste is sweet.

Constituents: Oil, emulsin, sugar, proteids, etc.

Dose: None given.

Preparations:

Emulsum Amygdalæ. (Vehicle.)

Oleum Amygdalæ Expressum. (Used pharmaceutically.)



PEPO

1, 2, 3, 4, and 5, Various commercial varieties of seed.
 6, Testa removed to show the seed.

PEPO U. S. P.

English name: Pepo.

Synonyms: Pumpkin Seed.

Botanical origin: *Cucurbita Pepo* Linné. (Fam. *Cucurbitaceæ*.)

Part used: Ripe seed.

Impurities: Not more than 5 per cent. of other substances.

Assay: None given.

Ash: None given.

Habitat: Cultivated in America.

Description:

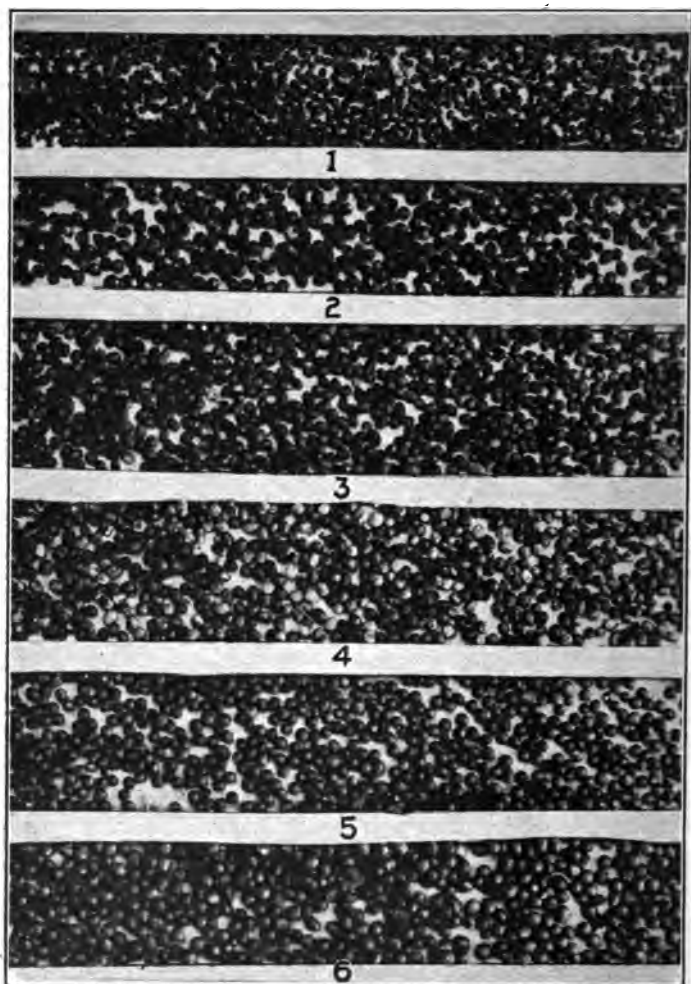
Pumpkin Seed *occurs* as entire and compressed seeds. Pumpkin is an exalbuminous seed. The *base* of the seed is rounded. The *margin* is entire. The *apex* is tapering and irregularly truncate. The *outline* varies from ovate to oval to elliptical. The *color* is yellowish or grayish white. The *sizes* of the different varieties of pumpkin seeds are extremely variable. The mammoth variety measure 3.5 cm. or less in length and 2.3 cm. or less in width and 5 mm. or less in thickness. The two *flattened surfaces* are smooth, and they have a raised portion parallel to the length, with two grooves and a slight ridge between. The remaining portion of the surface is convex. The *testa* has a tough outer layer and a thin greenish inner layer. The cotyledons are yellowish white and they make up the greater part of the seed. The odor is slight. The *taste* is sweet and oily.

Constituents: Fixed oil, resin, starch, sugar, proteids, etc.

Dose: 30 Gm. (1 ounce).

Preparations:

None.



SINAPIS NIGRA

1, German brown mustard. 2, English brown mustard.
3, Bari brown mustard. 4, Trieste brown mustard. 5, Cali-
fornia brown mustard. 6, Levant mustard.

SINAPIS NIGRA (Sinap. Nig.) U. S. P.

English name: Black Mustard.

Synonyms: Brown Mustard.

Botanical origin: *Brassica nigra* (Linné) Koch.
(Fam. *Cruciferae*.)

Part used: Ripe seeds.

Impurities: Not more than 5 per cent. of other seeds
or other foreign matter.

Assay: None given.

Ash: Not more than 9 per cent.

Habitat: Europe and Asia; naturalized in North
America.

Description:

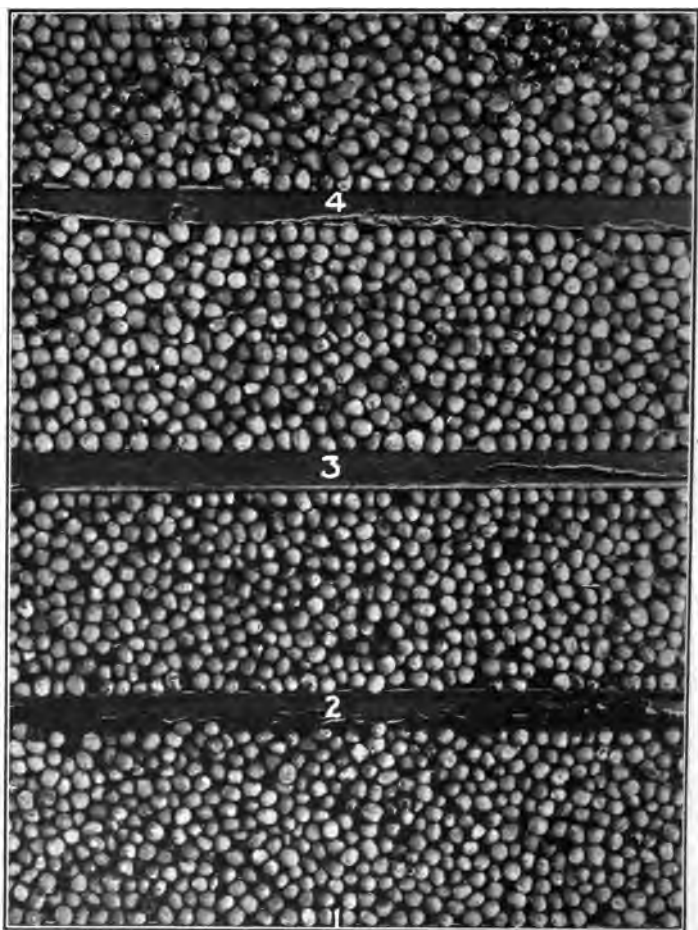
Black Mustard occurs as entire seeds. It is an exalbuminous seed. The outline varies from globular to subglobular. Black mustard has a maximum diameter of 2.5 mm. The color varies from gray to yellow to reddish brown. The surface is shiny and finely reticulate when magnified with a simple lens. The base of the seed is constricted to a small point and is gray in color. The embryo is greenish yellow. The odor is aromatic when the seed is moistened. The taste is very strongly pungent.

Constituents: Gum, fixed oil, glucoside (sinigrin),
myrosin, mucilage, proteids, etc.

Dose (Emetic): 10 Gm. (2½ drachms).

Preparations:

Oleum Sinapis Volatile; Dose, 0.008 mil (¼ min.).



SINAPIS ALBA

1, English yellow mustard. 2, Dutch yellow mustard. 3, German yellow mustard. 4, California yellow mustard.

SINAPIS ALBA (Sinap. Alb.) U. S. P.

English name: White Mustard.

Synonyms: Yellow Mustard.

Botanical origin: *Sinapis alba* Linné. (Fam. *Cruciferae*.)

Part used: Ripe seeds.

Impurities: Not more than 5 per cent. of other seeds or other foreign matter.

Assay: None given.

Ash: Not more than 9 per cent.

Habitat: Europe and Asia; naturalized in North America.

Description:

White Mustard *occurs* as entire seeds. It is an exalbuminous seed. The *outline* varies from globular to subglobular. White mustard has a maximum diameter of 3 mm. The *color* varies from light to dark yellow. One of the curved surfaces has a ridge and two grooves parallel to its length; the opposite curved edge has no groove or ridge. The *embryo* is greenish yellow. The *odor* is aromatic when the seed is moistened. The *taste* is very strongly pungent.

Constituents: Gum, fixed oil, glucoside (sinalbin), enzyme (myrosin), mucilage, acids, etc.

Dose (Emetic): 10 Gm. (21½ drachms).

Preparations:

None.



GUARANA

- 1, Part of a larger cylinder of guarana. 2, Crack in the surface. 3, Broken end of a cylinder showing white part of seeds.

GUARANA U. S. P.

English name: Guarana.

Synonyms: Guarana Paste.

Botanical origin: *Paullinia Cupana* Kunth. (Fam. *Sapindaceæ*.)

Part used: Seeds, crushed.

Impurities: None given.

Assay: Not less than 4 per cent. of caffeine.

Ash: None given.

Habitat: Brazil and Venezuela.

Description:

Guarana occurs as crushed seeds molded into cakes or cylindrical pieces. Guarana is fruit. The outline of the cylindrical pieces is oblong and usually widest at the center. These pieces measure 20 dm. or less in length and 4.8 cm. or less in diameter. The color varies from reddish brown to black. The surface is smooth or rough; the roughness is caused by slightly projecting portions of seed. The fractured surface is uneven and chocolate brown; occasionally it shows entire three-angled seeds or small seed cavities. The odor is not distinct. The taste is slightly bitter and astringent.

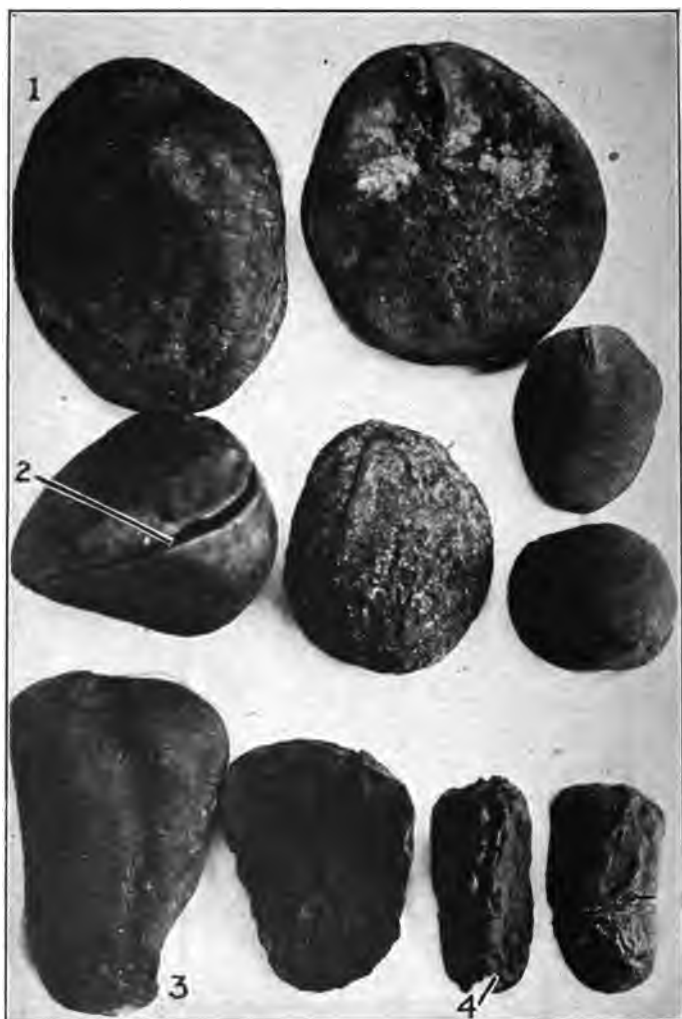
Constituents: Caffeine, tannin, gum, starch, fixed oil, volatile oil, saponin, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Elixir Guaranae N. F.; Dose, 4 mls (1 fl. dr.).

Fluidextractum Guaranae; Dose, 2 mls (30 min.).



KOLA

1, Nearly circular cotyledon. 2, Space between the cotyledons. 3, 4, African Kola nuts.

KOLA (Kola) N. F.

English name: Kola.

Synonyms: Cola, Kola-nut.

Botanical origin: Several species of *Cola* Schott and Endlicher. (Fam. *Sterculiaceæ*.)

Part used: Dried cotyledons.

Impurities: None given officially.

Assay: Not less than 1.5 per cent. of caffeine.

Ash: Not more than 3 per cent.

Habitat: Africa and West Indies.

Description:

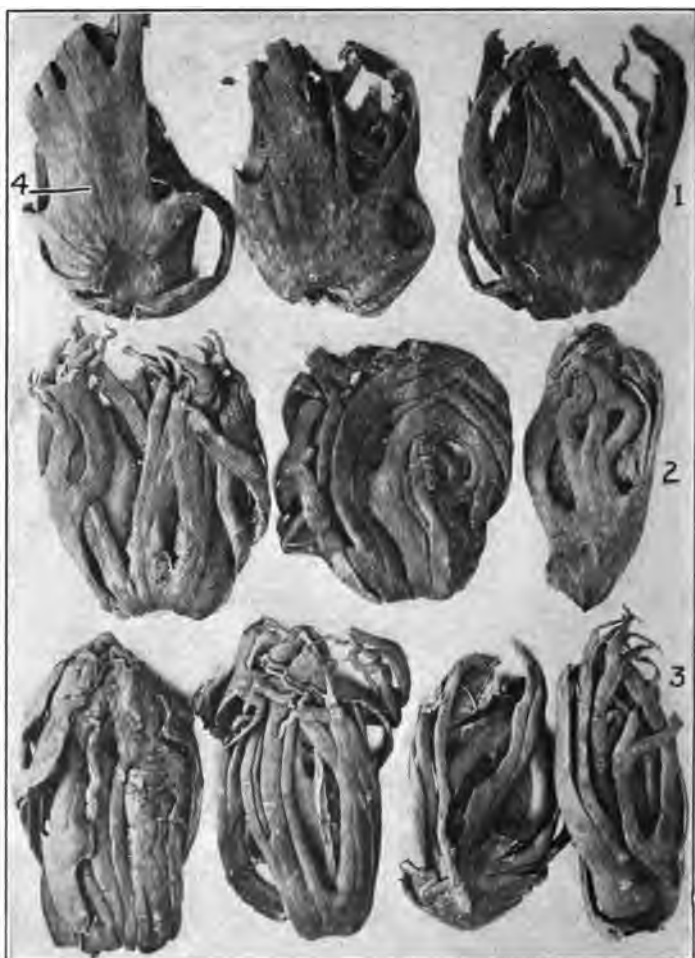
Kola occurs as the separated or united cotyledons. The *base* is usually rounded and smaller than the apex. The *margin* is entire. The *apex* is rounded. The *outline* varies from rotund to oval to irregular when the cotyledons are united. The united cotyledons measure 4 cm. or less in length, 3.5 cm. or less in width, and 22 mm. or less in thickness. The *color* varies from yellowish to reddish brown. The *surface* is dull and rough or smooth, and there is a space where the cotyledons have separated. At the base of the separated cotyledons there is an embryo. The *odor* is not distinct. The *taste* is slightly astringent.

Constituents: Alkaloids (caffeine, theobromine), sugar, starch, tannin, coloring matter, ferment, etc.

Dose: 4 Gm. (1 drachm).

Preparations:

Fluidextractum Kolæ; Dose, 4 mils (1 fl. dr.).



MACIS

- 1, Banda mace. 2, Siam mace. 3, West India mace.
4, Broad bands of Banda mace.

MACIS N. F.

English name: Mace.

Synonyms: Flowers of Mace.

Botanical origin: *Myristica fragrans* Houttuyn.
(Fam. *Myristicaceæ*.)

Part used: Arillode of seed.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 3 per cent., which is almost completely soluble in hydrochloric acid.

Habitat: Molucca Islands; cultivated extensively in tropical countries.

Description:

Mace occurs as entire and broken compressed pieces of the arillode. The *base* is blunt or slightly notched, and it has a large circular scar. The *apex* is irregular. The *outline* is variable. The arillode measures 40 mm. or less in length and 30 mm. or less in width. The *color* varies from yellow to yellowish red. The *surface* is smooth, and it is usually solid near the base, but divided above into narrow bands which overlap at the apex. The arillode is brittle. The *odor* is aromatic. The taste is pungent and oily.

Constituents: Fixed and volatile oils, resin, sugar, proteids, mucilage, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Oleum *Myristicæ*; Dose, 0.2 mil (3 min.).



Cinnamon, 50 lbs. Square wooden case covered with matting and tied with strips of bamboo. Case contains about 24 bundles, each with three bands.

Cassia Buds, 50 lbs. Outer burlap, box covered with paper and an inner burlap covering.

Cassia Cinnamon, 50 lbs. 24 oblong bundles. 3 bamboo bands.

China Chips, 50 lbs. In matting and tied with thick bamboo.

CHAPTER XV

ALGÆ AND FUNGI

ALGÆ

THERE are two official algæ: fucus, a brown alga; and chondrus, a red alga. The plant body is called a *thallus*. It is not divided into root, stem, and leaves.

Fucus is brownish green when first collected, but it changes to black upon drying. The air bladders (vesicles), occurring in pairs, are the most characteristic portions of the thallus.

Chondrus is deep red when recently gathered; but before it is supplied to commerce it is bleached by sea water and sunlight.

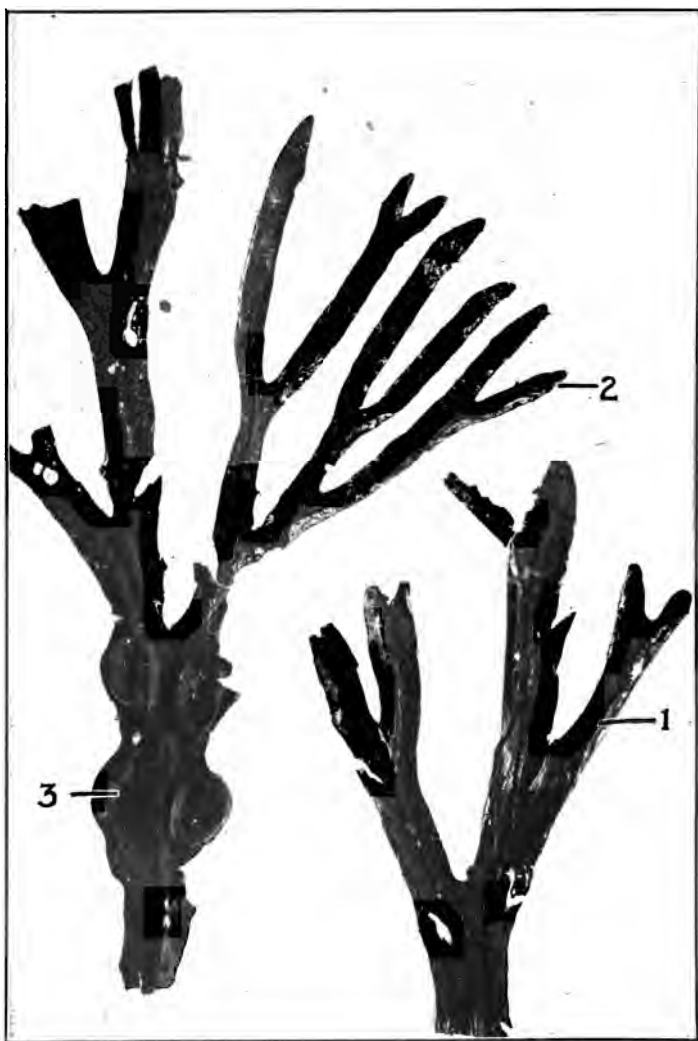
There are two species of red algæ official under chondrus; they differ greatly, and the differences are described in the descriptions of the drugs.

FUNGI

The three official fungi are yeast, ergot and agaric. The fungi differ from other groups of plants because they contain no chlorophyl; therefore, they cannot manufacture their own foods. Because they obtain their food from decaying organic matter, they are called saprophytes. Yeast is a unicellular (one-celled) fungus, and its structure can be studied only under the microscope.

Ergot is the rusting stage (sclerotium) of *Claviceps purpurea*. Under natural conditions it develops into a plant which would produce spores.

Agaric is a large fungus common on the European larch tree. After the fungus is collected, it is peeled and dried before it is used as a medicine. The commercial drug, therefore, no longer greatly resembles a fungus.



FUCUS

1. Dichotomously branched thallus. 2, Branches of variable length. 3. Air vesicles occurring in pairs.

FUCUS (Fuc.) N. F.

English name: Fucus.

Synonyms: Bladderwrack, Bladder Fucus.

Botanical origin: *Fucus vesiculosus* Linné. (Fam. *Fucaceæ*.)

Part used: Dried thallus.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 20 per cent.

Habitat: Shores of the North Pacific and North Atlantic Oceans.

Description:

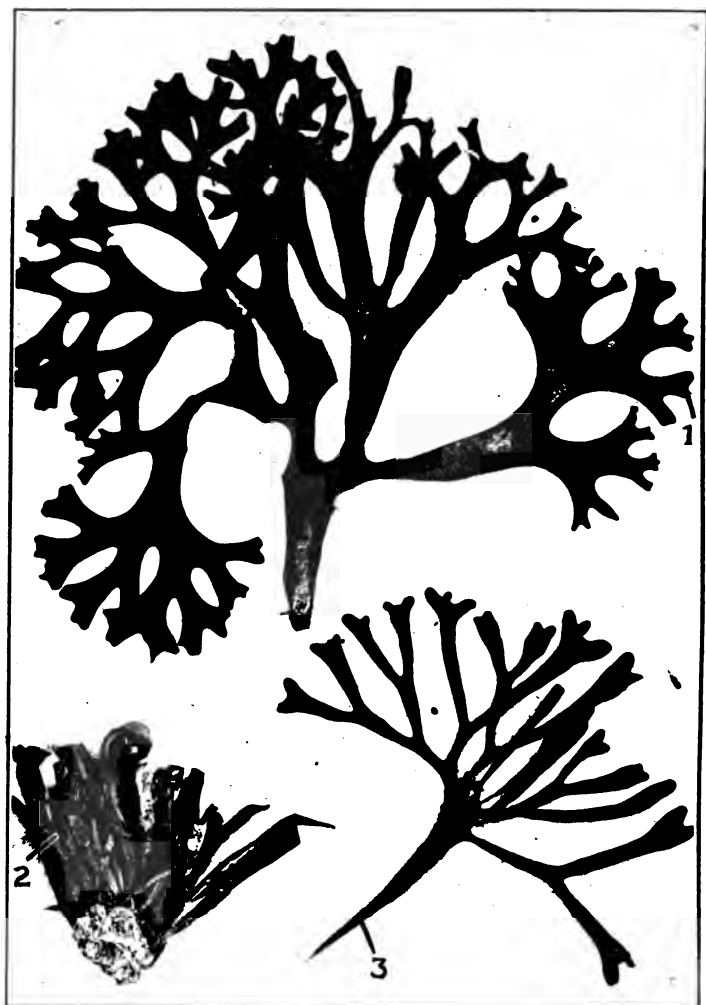
Fucus occurs as entire and as broken pieces of the plant (thallus). These pieces measure up to 4 dm. in length and up to 2 cm. in width. The thallus is dichotomously branched. The base of the thallus is cylindrical and the branches are mostly flattened. Each branch separates into two branches or is simple. The texture is cartilaginous. The color varies from brown to black. The surface has air vesicles usually occurring in pairs, a prominent midrib, and frequently white deposits of saline matter. Frequently the tips of the branches are enlarged because of great numbers of rounded, projecting, reproductive tissues. The odor is slight. The taste is saline and mucilaginous.

Constituents: Volatile oil, mucilage, cellulose, mannitol, iodine, etc.

Dose: 0.65 Gm. (10 grains).

Preparations:

Fluidextractum Fuci; Dose, 0.65 mil (10 min.).



CHONDRUS (CRISPUS)

1, Plant with dichotomously branched ends. 2, Numerous plants attached to the small stone. 3, Stem-like parts of the thallus.

CHONDRUS (Chond.) U. S. P.

(1) Chondrus Crispus

English name: Chondrus.

Synonyms: Irish Moss, Carrageen.

Botanical origin: *Chondrus crispus* (Linné) Stackhouse. (Fam. *Gigartinaceæ*.)

Part used: Dried plant.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Shores of Atlantic Ocean.

Description:

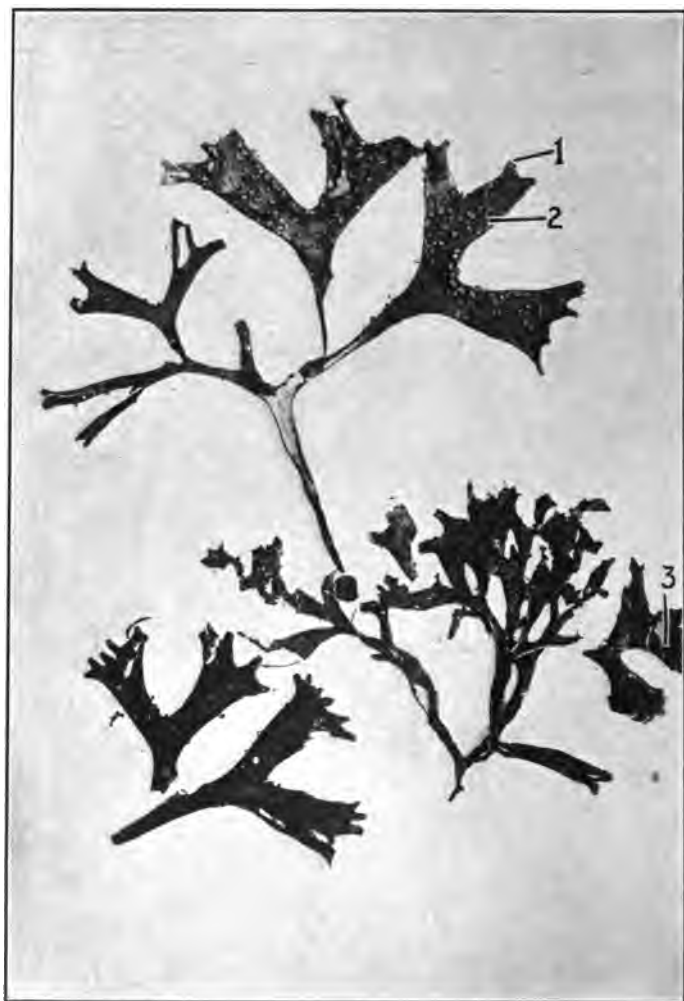
Chondrus crispus occurs as entire or broken pieces of the plant (thallus). These pieces measure up to 12 cm. in length. The plant is dichotomously branching in pairs. The base of the plant is cylindrical and the branches are flat. Each branch separates into two branches. Frequently a fragment of rock occurs in the drug with several attached bases. The texture is cartilaginous. The color varies from yellowish white to red. The surface is smooth, frequently with small shells of crustacea. The plant is pliable. The outline is irregular. There is no microscopic difference in the tissues of the thallus. The odor is slight. The taste is salty and mucilaginous.

Constituents: Mucilage, pectin, proteids, etc.

Dose: None given.

Preparations:

Gelatinum Chondri N. F.
Mucilago Chondri N. F.



CHONDRUS (GIGARTINA MAMILLOSA)

1. Broad thallus with short dichotomously branched tips.
2. Papillate sporangia. 3. Broken fragments of the plant.

CHONDRUS (Chond.) U. S. P.

(2) *Gigartina Mamillosa*

English name: Chondrus.

Synonyms: Irish Moss, Carrageen.

Botanical origin: *Gigartina mamillosa* (Goodenough et Woodward) J. Agardh. (Fam. *Gigartinaceæ*.)

Part used: Dried plant.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None given.

Habitat: Shores of Atlantic Ocean.

Description:

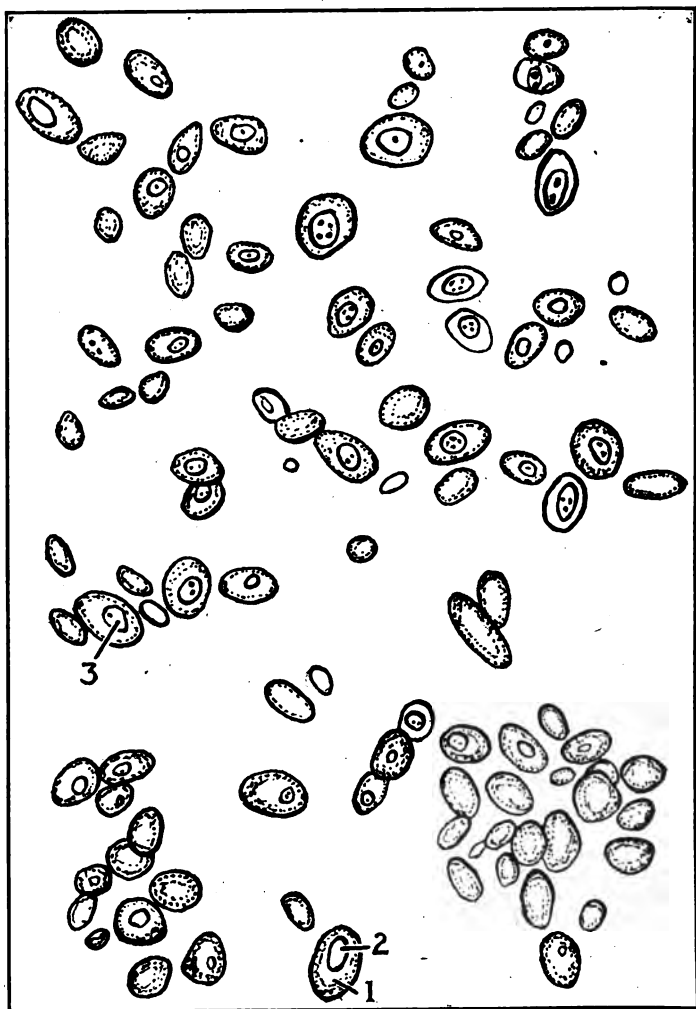
Gigartina mamillosa occurs as entire or broken pieces of the plant (thallus). These pieces measure up to 10 cm. in length. The plant is dichotomously branched. The base of the plant is cylindrical, and the branches are flat. Each branch separates into two branches. The texture is cartilaginous. The color varies from yellowish white to red. The surface has numerous slender papillate sporangia (reproductive bodies) scattered over the surface and an occasional shell. The outline is irregular. There is no microscopic difference in the tissues of the thallus. The odor is slight. The taste is salty and mucilaginous.

Constituents: Mucilage, pectin, proteids, etc.

Dose: None given.

Preparations:

Gelatinum Chondri N. F.
Mucilago Chondri N. F.



CEREVISIÆ FERMENTUM COMPRESSUM

1, Granular protoplasm. 2, Vacuole. 3, Globules of fat.

CEREVISIÆ FERMENTUM COMPRESSUM

(Cerev. Ferm. Compr.) N. F.

English name: Compressed Yeast.

Synonyms: None.

Botanical origin: *Saccharomyces cerevisiæ* Meyen, or other species of *Saccharomyces*. (Fam. *Saccharomycetaceæ*.)

Part used: Moist, living cells, combined with a starchy or absorbent base.

Impurities: None given officially.

Assay: None given.

Ash: None given.

Habitat: In sugary solutions.

Description:

Yeast occurs in compressed masses or cakes. It is a *fungus*. The cakes are variable in size. The *texture* is moist and starchy. The *color* is yellowish white. The *surface* is granular, the *odor* aromatic and the *taste* bitter. Under the microscope compressed yeast is seen to be composed of yeast and starch. The starch is readily recognized by the blue color developed when Lugol's solution is added. Yeast is oval or spherical. The *wall* is thin. The vacuoles have small globules of fat, and the protoplasm is granular.

Dose: None given. (Used for making fermented milk.)

Preparations:

None.



Cassia Fistula, 110 lbs. Bamboo basket and an outer covering of burlap. The only drug that is packed in this way.

PERSIO N. F.

English name: Cudbear.

Synonyms: Red Indigo.

Botanical origin: Species of *Roccella* De Candolle, *Lecanora* Acharius and other lichens.

Part used: Purplish-red powder.

Impurities: None given.

Assay: None given.

Ash: Not more than 35 per cent., consisting mainly of sodium chloride.

Habitat: Sweden, East Indies, Holland and California.

Description:

Cudbear occurs as a fine or coarse powder of a purplish red color. Its botanical origin can be determined only when viewed under the compound microscope.

Constituents: Not investigated.

Dose: Not used medicinally. (Coloring agent.)

Preparations:

Tinctura Persionis.
Tinctura Persionis Composita



AGARICUS

1, White inner tissues. 2, Outer worthless part of the fungus.

AGARICUS (Agaric.) N. F.

English name: Agaric.

Synonyms: White Agaric, Larch Agaric.

Botanical origin: *Polyporus officinale* Fries. (Fam. *Polyporaceae*)

Part used: Dried fruit body.

Impurities: Not more than 10 per cent. of foreign matter.

Assay: Yields to boiling alcohol not less than 50 per cent. resinous extract.

Ash: Not more than 2 per cent. of white ash rich in phosphates.

Habitat: Europe and Asia.

Description:

Agaric occurs as entire or broken pieces of the peeled fungus. Agaric is a fungus. The outline of the pieces is irregular. Agaric measures 35 cm. or less in height, 2.5 cm. or less in width, and 12 cm. or less in thickness. The color varies from grayish yellow to light brown. The surface is rough and fibrous-appearing, but soft to the touch. The fracture is tough. The broken surface is similar to the outer surface. The odor is not distinct. The taste is sweet, acrid and bitter.

Constituents: Agaric acid, resin, etc.

Dose: 0.6 Gm. (10 grains).

Preparations:

None.



ERGOTA

1, 2, 3, Large and small ergots. 4, Longitudinal section of grain. 5, 6, Cross-sections.

ERGOTA U. S. P.

English name: Ergot.

Synonyms: Rye Ergot, Smut of Rye, Spurred Rye, Secale Cornutum P. I.

Botanical origin: *Claviceps purpurea*. (Fam. *Hypocreaceae*.)

Part used: Dried sclerotium.

Impurities: Not more than 5 per cent. of seeds, fruits or other foreign matter.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Russia, Spain, Germany and France.

Description:

Ergot occurs as entire, rarely as broken, curved, or straight pieces. Ergot is the sclerotium of *Claviceps purpurea*. The outline is oblong-cylindrical and tapering at either end. Ergot measures 4 cm. or less in length and 7 mm. or less in diameter. The surface is longitudinally furrowed and fissured, and transversely fissured. The color varies from purple to purplish black. The fracture is brittle. The fractured surface is indistinctly triangular and is deeply indented on three sides. The outer layer of the sections is purplish black, the inner layer white or purplish white. The odor is distinct. The taste is oily.

Constituents: Alkaloids (ergotine, cornutine, ergotoxine, ecboline, tyramine, etc.), acids (ergotinic, sclerotic, etc.), lucin, mannit, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Extractum Ergotæ; Dose, 0.25 Gm. (4 grains).

Extractum Ergotæ Aquosum N. F.; Dose, 0.2 Gm. (3 grains).

Fluidextractum Ergotæ; Dose, 2 mls (30 min.).

Tinctura Ergotæ Ammoniata N. F.; Dose, 4 mls (1 fl. dr.).



Cloves, 125 lbs. Mats with a coarse rope tied three times around the short diameter of the bale and passed around the two sides of the long diameter. Capsicum comes in similar packages.

CHAPTER XVI

SPORES, NON-GLANDULAR AND GLANDULAR HAIRS, AND EXCRESCENCES

SPORES

*L*YCOPODIUM is the only official spore. These spores are microscopic. These spores in nature continue the life of the species by growing under suitable conditions into a lycopodium plant. They are used in a mechanical way as a dusting powder and not as a remedial agent.

NON-GLANDULAR HAIRS

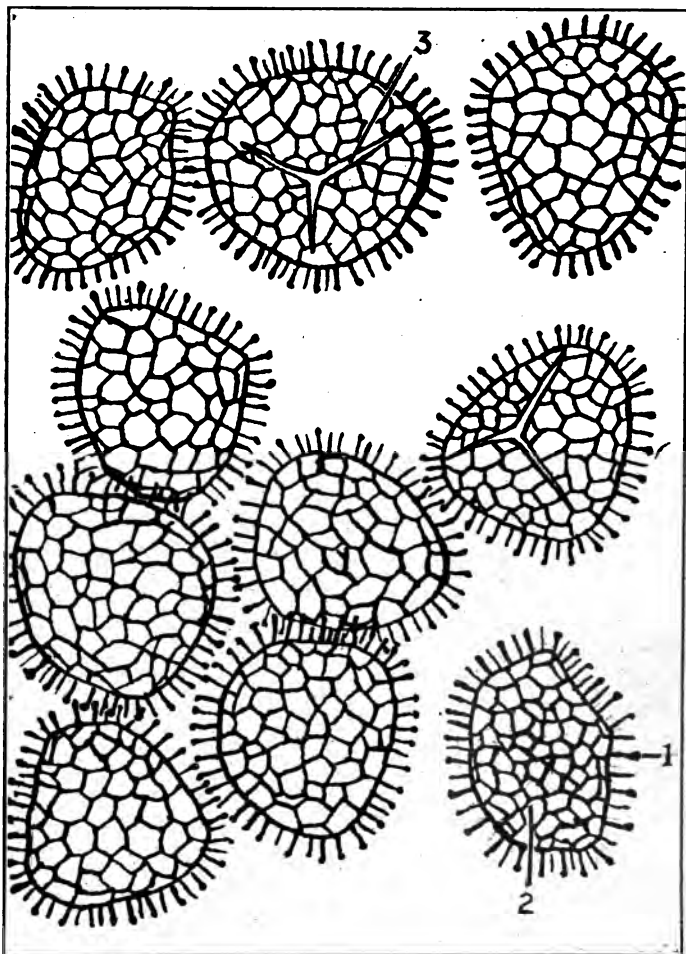
Cotton is the official non-glandular hair. The hairs are separated from cotton seed produced by the familiar cotton plant of the south. As cotton is used in medicine as an absorbent, it must be free of fat and aseptic. The hairs are very long and thread-like, and their structure is microscopic.

GLANDULAR HAIRS

Lupulin, the glandular hair separated from the scales of hops, secretes and contains the oleoresin or active constituent of hops. Two views of lupulin, which has a microscopic structure, are shown.

EXCRESCENCES

Nutgall is an excrescence formed as the result of an insect (*Cynips tinctoria*) stinging and depositing its eggs in the young leaf of European oak (*Quercus infectoria*). A gall or excrescence is developed instead of a leaf. There are many different types of galls, but they are all different from nutgall.



LYCOPODIUM

1, Hair-like projection. 2, Reticulate surface. 3, Characteristic marking of the spore.

LYCOPODIUM (Lycopod.) U. S. P.

English name: Lycopodium.

Synonyms: Club Moss, Running Moss, Snake Moss.

Botanical origin: *Lycopodium clavatum* Linné. (Fam. *Lycopodiaceæ*.)

Part used: Spores.

Impurities: Not more than 2 per cent.

Assay: None given.

Ash: Not more than 3 per cent.

Habitat: Europe and Asia.

Description:

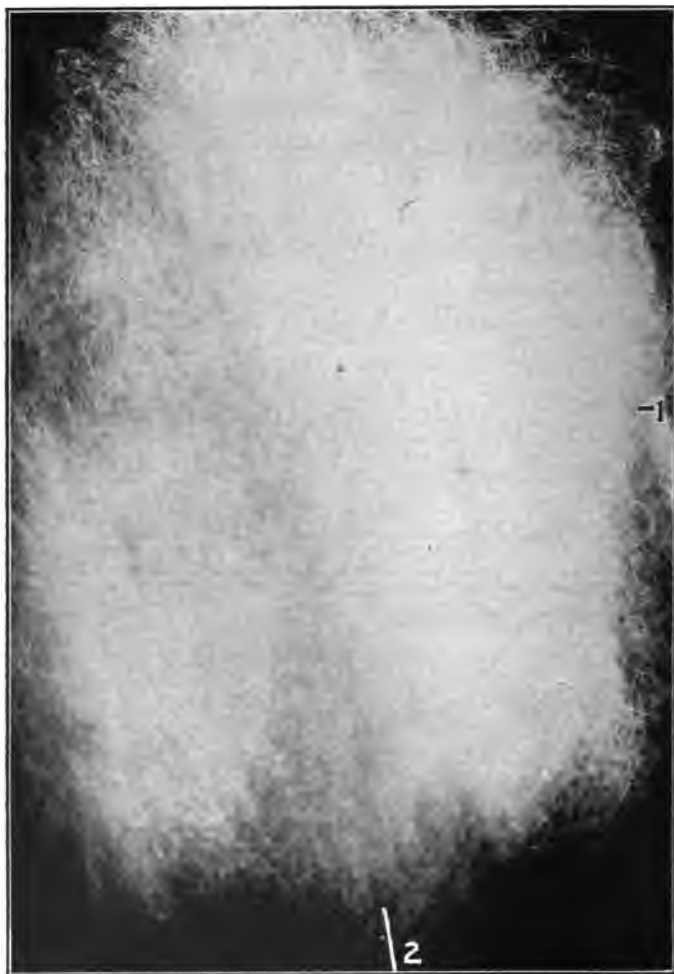
Lycopodium occurs as a powder consisting of microscopic entire spores. The powder is light yellow. It floats on water; when thrown into the air and ignited it burns with a flash. The only scientific means of identifying lycopodium is under the compound microscope. The spores, when magnified under the high power of the microscope, have one convex surface and three plane surfaces. The outer is reticulate and at the point of union of the wall there is a hair-like projection. These show best when the margin is in focus. The line of union of the plane surfaces frequently appears as a cross or triangle. The odor is not distinct; taste is wanting.

Constituents: Fixed oil, sugar, etc.

Dose: None. Not used internally.

Preparations:

None.



GOSSYPIUM PURIFICATUM

1, Mass of cotton. 2, Separated fibers.

GOSSYPIUM PURIFICATUM

(Gossyp. Purif.) U. S. P.

English name: Purified Cotton.

Synonyms: Absorbent Cotton.

Botanical origin: *Gossypium herbaceum* Linné. (Fam. *Malvaceæ*.)

Part used: Hairs of seed freed from adhering impurities and linters and deprived of fatty matters.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 0.2 per cent.

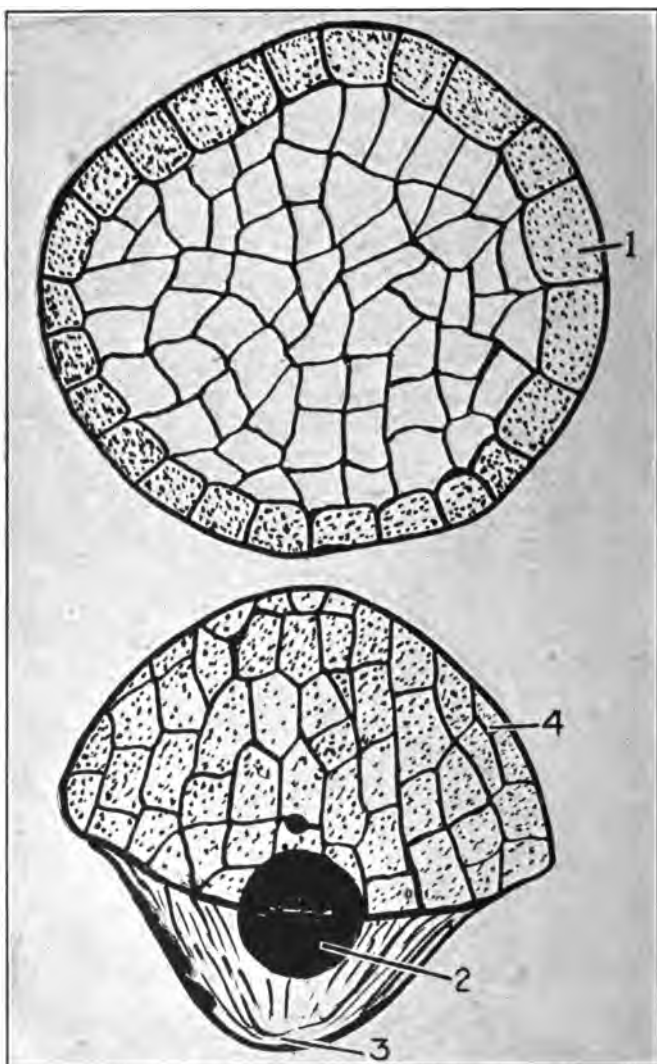
Habitat: Asia, Africa, China; cultivated extensively.

Description:

Purified cotton occurs as tangled masses of entire or broken hairs. Cotton is a unicellular hair. The color is white and the texture is soft and fibrous. When seen under the high power of the microscope cotton is either flat or twisted. The edges are thickened and the central part is structureless. There is no odor or taste to purified cotton.

Preparations:

Gossypium Stypticum N. F.



LUPULINUM

1, Surface view of glandular hair. 2, Oleoresin mass. 3, Surface without cellular structure. 4, Reticulate surface.

LUPULINUM (Lupul.) N. F.

English name: Lupulin.

Synonyms: None.

Botanical origin: *Humulus Lupulus* Linné. (Fam. *Moraceæ*.)

Part used: Glandular trichomes from the strobiles.

Impurities: None given officially.

Assay: Not less than 60 per cent. soluble in ether.

Ash: Not more than 16 per cent.

Habitat: Asia and Europe; cultivated in countries having a temperate climate.

Description:

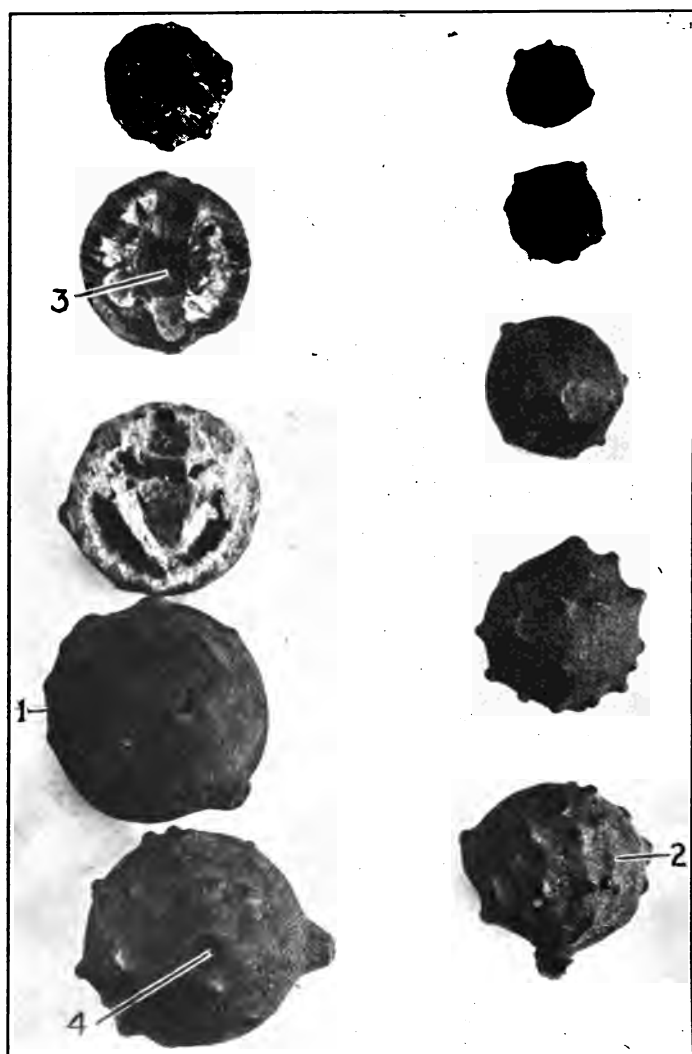
Lupulin occurs as a sticky powder, consisting of entire multicellular, glandular hairs with angled walls. The color varies from lemon yellow to yellowish brown. It floats on water. Under the high power of the compound microscope the spores, when viewed from the top, are nearly circular and the outer layer of cells is in sharp focus, while the remaining curved part is not so distinct. When the spores are viewed the tube of the microscope must be gradually raised. If looked at from the side the spores are seen to be mushroom-shaped. The walls of the upper part are distinct, those of the lower part indistinct. Frequently the spores contain large globules of oil. The odor is aromatic. The taste is pungent and bitter.

Constituents: Resin, volatile oil, tannin, choline, asparagin, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Fluidextractum Lupulini; Dose, 0.5 mil (8 min.).
Oleoresina Lupulini; Dose, 0.2 Gm. (3 grains).



GALLA

1, Large perfect gall. 2, Tuberculated surface. 3, Central cavity of the gall. 4, Cylindrical opening formed by the escaping insect.

GALLA (Gall.) U. S. P.

English name: Nutgall.

Synonyms: Aleppo Galls, Smyrna Galls.

Botanical origin: *Quercus infectoria* Olivier and other allied species of *Quercus*. (Fam. *Fagaceæ*.)

Part used: Excrescences on the young twigs.

Impurities: None given in U. S. P.

Assay: Not more than 5 per cent. of galls floats in water.

Ash: None given.

Habitat: Mediterranean Basin, Asia Minor, Persia.

Description:

Nutgall occurs in the entire condition. It is a gall. The base of the gall is constricted and is frequently attached to a short-leaf petiole. The margin is irregular. The apex is rounded. The outline is globular. They measure 28 mm. or less in length and 25 mm. or less in diameter. The color varies from bluish gray to yellowish brown. The surface is tuberculated. The bored galls have a circular opening. Sawed galls have sunken spaces, a dark, circular, central cavity and a cylindrical canal extending to the surface; the latter is formed by the escaping insect. The color of the inner surface varies from gray to brown. The odor is not distinct. The taste is very strongly astringent.

Constituents: Tannic, gallic and ellagic acids, sugar, resin, starch, albuminous matter, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Tinctura Gallæ N. F.; Dose, 4 mls (1 fl. dr.).
Unguentum Gallæ.



Aloes. Barrel of Gourd Aloes. Keg of Socotrine Aloes. Two cases of Monkey-skin Aloes, one case with burlap and one case with matting. One monkey-skin suspended (left) to show method of transportation. Gourds (freed from seeds) filled with aloes and a piece of cloth stuck over the opening.

CHAPTER XVII

STARCH, GUM, SUGAR, AND MUCILAGE

STARCH

C*CORN STARCH* is the official starch. It is separated from corn by a special process. Corn starch has a characteristic microscopic structure. The purity of corn starch should always be determined because it is frequently adulterated with potato and other starches. Talcum is also frequently added to increase the weight.

SUGAR

Manna is a solid sugar obtained from the European ash tree. It has a very pleasing taste at first, but its final taste is rather disagreeable. The commercial product varies in price according to the size and cleanliness of the pieces. Refer to the different figures.

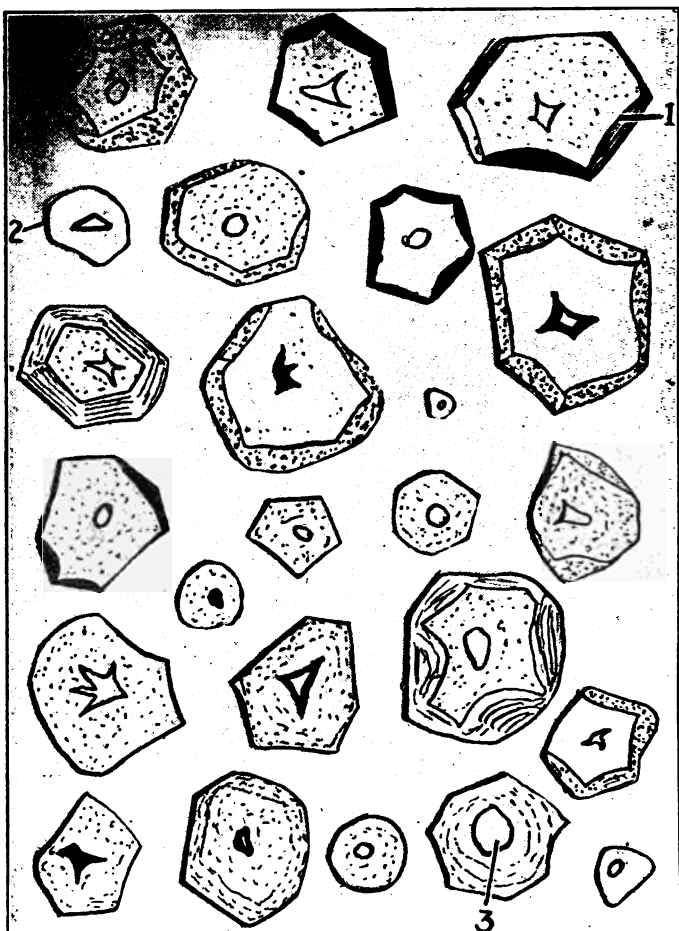
GUMS

Tragacanth and *acacia* are the official gums. *Tragacanth* is ribbon-like and has characteristic transverse ridges which are formed during the period of decreased rate of flow. The pieces are always dull and opaque.

Acacia occurs as straight, curved or rounded tears, which are frequently hollow in the center. The surface is shiny and transparent when recently collected, but when thoroughly dry, the surface is dull, full of cracks, and opaque.

MUCILAGE

The only official dried mucilage is *agar-agar*, prepared from Japanese sea-weed. It is used extensively in the preparation of culture media for growing bacteria. *Agar* is usually shredded, and frequently packed in bundles.



AMYLUM

1, Starch grain with angled outline. 2, Grain with rounded outline. 3, Round hilum or space.

AMYLUM (Amyl.) U. S. P.

English name: Starch.

Synonyms: Corn Starch.

Botanical origin: *Zea Mays* Linné. (Fam. *Gramineæ*.)

Part used: Starch separated from the grain.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 5 per cent. of white ash.

Habitat: South America; cultivated.

Description:

Corn Starch occurs as white powder consisting of entire starch grains. Corn starch is a starch. The powder is white and it is fine or in slightly angled masses. As seen under the high power of the microscope, the grains are rounded, angled, or rounded and angled in outline. The hilum is central, rounded or cleft. When Lugol's solution is added to the powder on the slide the grains are colored blue. The odor of starch is not distinct. The taste is starchy and slightly sweet.

Constituents: Granulose, cellulose, etc.

Dose: None given.

Preparations:

Glyceritum Amyli. (Excipient.)



MANNA

1, Three pieces of manna of variable size. 2, Small white tear. 3, Rounded tear. 4, Manna sorts consisting of agglutinated tears and impurities.

MANNA U. S. P.

English name: Manna.

Synonyms: None.

Botanical origin: *Fraxinus Ornus* Linné. (Fam. *Oleaceæ*.)

Part used: Dried saccharine exudation.

Impurities: None given in U. S. P.

Assay: Not less than 40 per cent. of the yellowish white fragments.

Ash: None given.

Habitat: Mediterranean Basin.

Description:

Manna occurs as entire and broken tears or sorts. Manna is a sugar. The outline of the larger pieces is oblong, and either flat or cylindrical. The pieces measure 25 cm. or less in length and 5.5 cm. or less in width. The color of large flake manna varies from white to yellowish white; of small flake manna, yellowish white; of manna sorts, yellowish brown. The surface is rough, flat or ridged. The fracture is very weak and brittle. The fractured surface is frequently three-sided. The odor is slight. The taste is sweet and slightly bitter.

Constituents: Mannit, glucose, mucilage, resin, etc.

Dose: 15 Gm. (4 drachms).

Preparations:

Infusum Sennæ Compositum; Dose, 120 mils (4 fl. ozs.).
Syrupus Mannæ N. F.; Dose, 8 mils (2 fl. drs.).



TRAGACANTHA

1, Broad ribbon. 2, Transverse band. 3, Serrate edge of a band. 4, 5, Different types of ribbons.

TRAGACANTHA (Trag.) U. S. P.

English name: Tragacanth.

Synonyms: Gum Tragacanth.

Botanical origin: *Astragalus gummifer* Labillardière
or other Asiatic species of *Astragalus*. (Fam. *Leguminosæ*.)

Part used: Gummy exudation from the stems.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 3.5 per cent.

Habitat: Asia Minor, Persia and Syria.

Description:

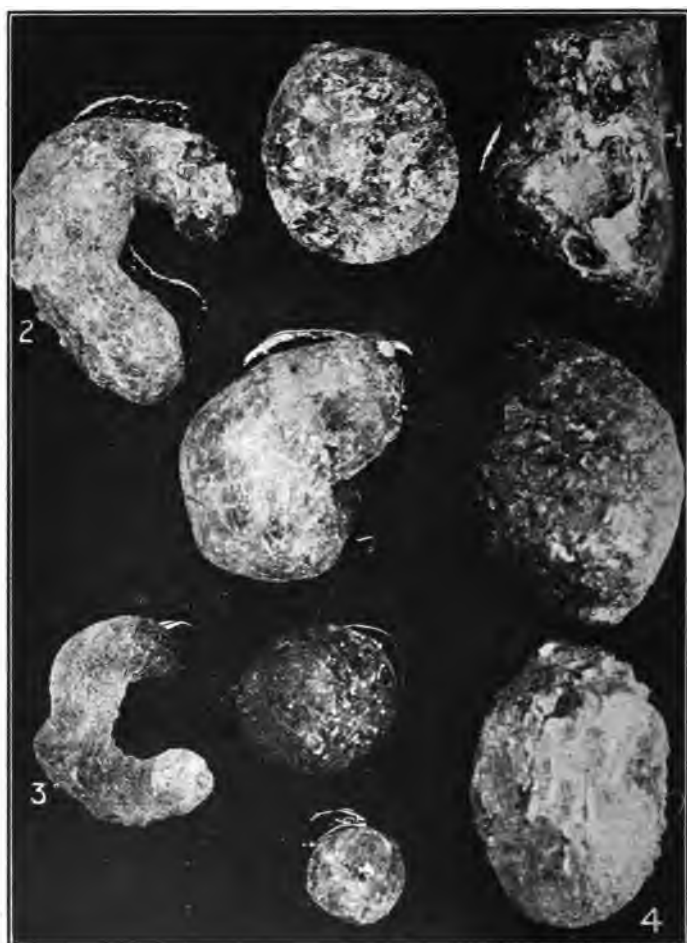
Tragacanth occurs as entire or broken, flattened pieces. Tragacanth is a gum. The outline is usually oblong and curved or straight. The pieces measure 12 cm. or less in length and 28 mm. or less in diameter. The surface has transverse bands. The color varies from white to yellowish white. The fracture is brittle. The texture is horny. The odor is not characteristic. The taste is mucilaginous.

Constituents: Soluble and insoluble gum and starch, pectin, etc.

Dose: None given.

Preparations:

Glyceritum Tragacanthæ N. F.
Mucilago Tragacanthæ.



ACACIA

1, 2, 3, 4. Different types of acacia tears.

ACACIA (Acac.) U. S. P.

English name: Acacia.

Synonyms: Gum Arabic, Gum Acacia, Gum Senegal.

Botanical origin: *Acacia Senegal* Willdenow and other African species of *Acacia*. (Fam. *Leguminosæ*.)

Part used: Dried gummy exudation.

Impurities: Not more than 1 per cent. of powdered acacia is insoluble in water.

Assay: When powdered, contains not more than 15 per cent. of moisture.

Ash: Not more than 4 per cent.

Habitat: Africa.

Description:

Acacia occurs as entire and broken tears. *Acacia* is a *gum*. The *outline* varies from globular to oblong-cylindrical, and the pieces are straight and curved. The pieces measure 8 cm. or less in length and 5 cm. or less in width. The *color* varies from gray to pink and is opaque. The *surface* is smooth when the drug has been recently gathered, but fissured after it has been kept for some time. The *fracture* is brittle. The *fractured surface* is frequently glistening. The *odor* is not distinct. The *taste* is slightly sweet and mucilaginous.

Constituents: Arabin (arabic acid), pararobin, etc.

Dose: None given.

Preparations:

Mucilago Acaciæ; Dose, 15 mils (4 fl. drs.).
Syrupus Acaciæ. (Vehicle.)



AGAR

1. Mass of agar-agar strips.

AGAR U. S. P.

English name: Agar.

Synonyms: Agar-Agar, Japanese Isinglass, Vegetable Gelatin.

Botanical origin: *Gracilaria* (*Sphaerococcus*) *lichenoides* Greville and other marine algæ growing along the eastern coast of China, particularly several species of *Gelidium* or *Gloiopeltis*. (Class *Rhodophyceæ*.)

Part used: Dried mucilaginous substance.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: Japan and China.

Description:

Agar occurs as folded flat pieces arranged in bundles. The outline of the pieces is oblong. Agar is of variable length and width. The color varies from gray to grayish brown. The surface is shiny and wrinkled. The fracture is tough. The odor is not distinct. The taste is mucilaginous.

Constituents: Pectin, gelose, etc.

Dose: 10 Gm. (2½ drachms).

Preparations:

None.



Small barrel of Guaiac (200 lbs.) in solid piece. Gum Myrrh, 200 lbs. Inner matting and outer burlap covering.

CHAPTER XVIII

RESINS, GUM RESINS, BALSAMS, BALSAMIC RESINS AND OLEORESINS RESINS

THE three official resins are rosin, guaiac and mastic.

Rosin is the residue left after distilling oil of turpentine from terebenthina.

Guaiac is a resin obtained from the official guaiac wood.

Mastiche is the only resin occurring as tears. It is friable, but it becomes plastic when chewed.

GUM RESINS

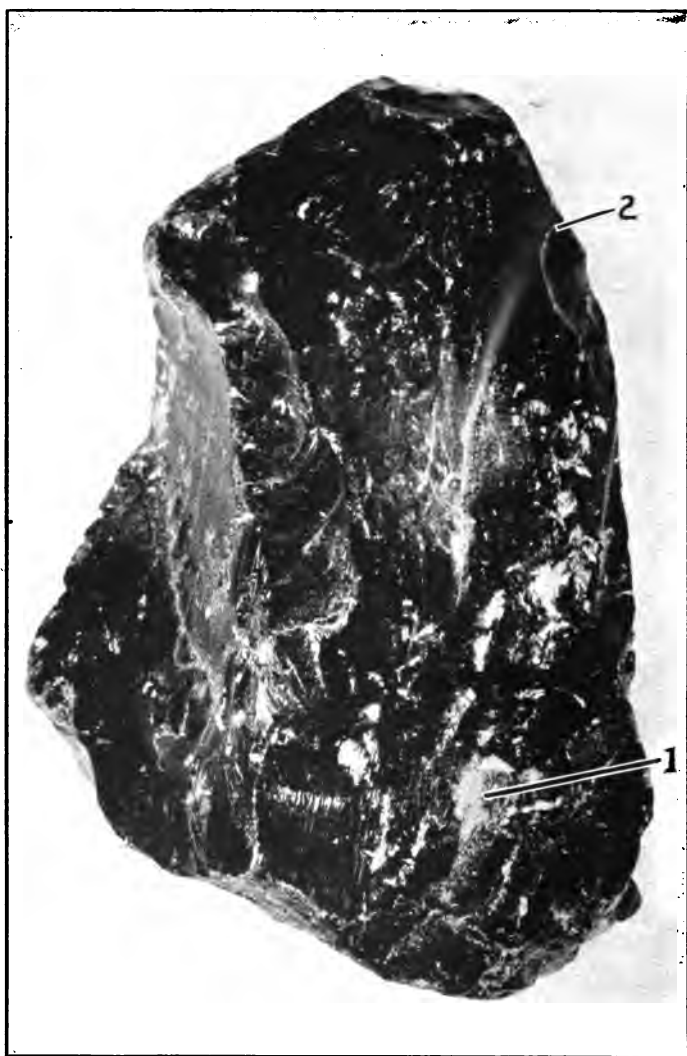
The official gum resins are *asafetida*, *gamboge* and *myrrh*. They all differ greatly in appearance; and in the case of *asafetida*, the odor is characteristically and disagreeably aromatic.

BALSAMIC RESINS

Benzoin is the only balsamic resin. The title includes the Sumatra and Siam varieties. Sumatra benzoin consists of a matrix of a reddish brown color surrounding light colored tears, while Siam benzoin consists wholly of tears.

OLEORESINS

The only solid oleoresin is *turpentine*, which is obtained by cutting the bark of several species of southern pine and collecting the excretion or oleoresin.



RESINA

1, Abraded white surface. 2, Concave surface.

RESINA (Resin.) U. S. P.

English name: Rosin.

Synonyms: Colophony, Georgia Pine Rosin, Yellow Pine Rosin.

Botanical origin: *Pinus palustris* Miller and other species of *Pinus*. (Fam. *Pinaceæ*.)

Part used: Residue left after distilling the volatile oil from the concrete oleoresin.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 0.05 per cent.

Habitat: Virginia, south to Florida and Texas.

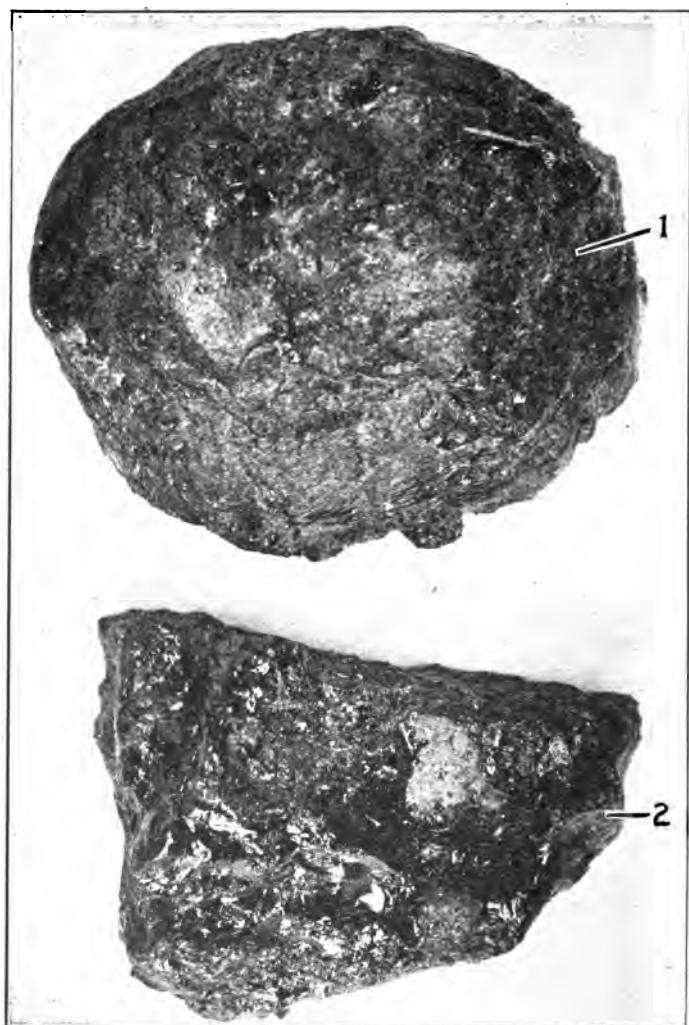
Description:

Resin occurs as irregular masses. Resin is a resin. The outline is irregular and angled, the size is variable, and the texture is vitreous. The color is yellowish brown; when the surface is abraded the color is white or yellowish white. The surface is translucent, powdery where abraded, and rough with numerous depressions. The fracture is conchoidal. The odor is slightly aromatic. The taste is pungent and terebinthinate.

Constituents: Abietinic acid or its anhydride, pinic and sylvic acids, etc.

Preparations:

Ceratum Resinæ.
Ceratum Resinæ Compositum N. F.
Emplastrum Elasticum.
Emplastrum Resinæ.



GUAIACUM

1, Round cake. 2, Piece of large cake.

GUAIACUM (Guaiac.) U. S. P.

English name: Guaiac.

Synonyms: Guaiac Resin.

Botanical origin: *Guaiacum officinale* Linné or *Guaiacum sanctum* Linné. (Fam. *Zygophyllaceæ*.)

Part used: Resin of the wood.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 4 per cent.

Habitat: South America, West Indies.

Description:

Guaiac occurs as angled fragments or as rounded masses. Guaiac is a resin. The outline of the fragments is angular, of the masses rounded. The pieces and fragments are variable in size. The texture is vitreous. The surface is dull, powdery and rough, and bears partially detached fragments of bark and wood. The fracture is hackly. Small fragments are yellowish green and shiny. The odor is not distinct. The taste is acrid.

Dose: 1 Gm. (15 grains).

Preparations:

Gargarisma Guaiaci Compositum N. F.

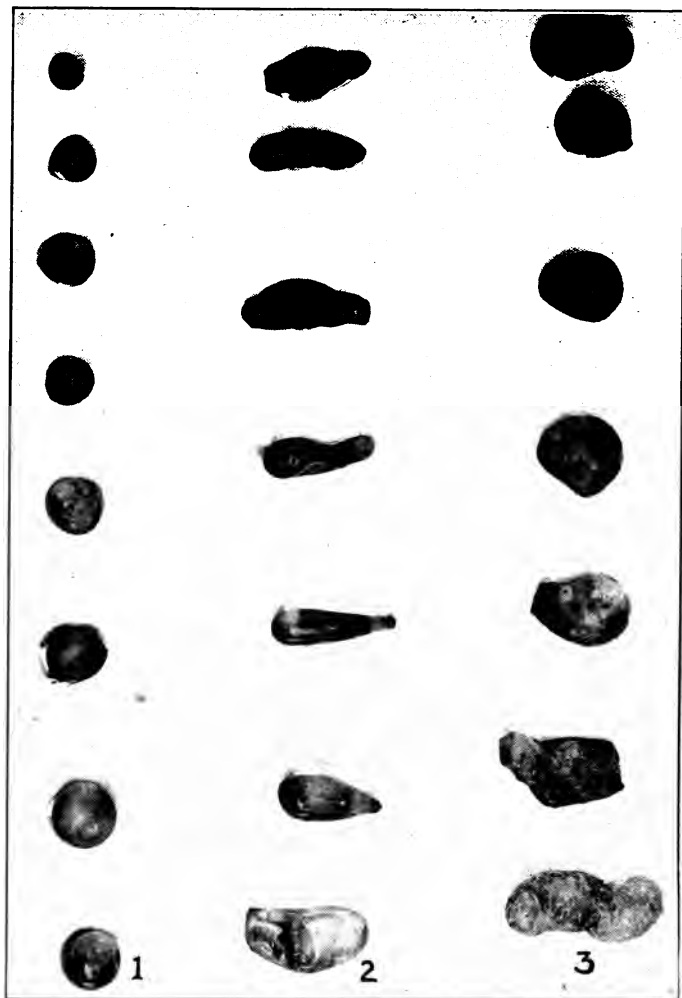
Glyceritum Guaiaci N. F.; Dose, 2 mls (30 min.).

Mistura Guaiaci N. F.; Dose, 15 mls (4 fl. drs.).

Tinctura Guaiaci; Dose, 4 mls (1 fl. dr.).

Tinctura Guaiaci Ammoniata; Dose, 2 mls (30 min.).

Tinctura Guaiaci Composita N. F.; Dose, 4 mls (1 fl. dr.).



MASTICHE

1, Globular tears. 2, Oblong tears. 3, Irregular tears.

MASTICHE (Mastic.) N. F.

English name: Mastic.

Synonyms: Mastix, Resin of Mastic.

Botanical origin: *Pistacia Lentiscus* Linné. (Fam. *Anacardiaceæ*.)

Part used: Concrete resinous exudation.

Impurities: None given officially.

Assay: Acid number is not less than 65.

Ash: None given.

Habitat: Mediterranean Basin, Island of Scio.

Description:

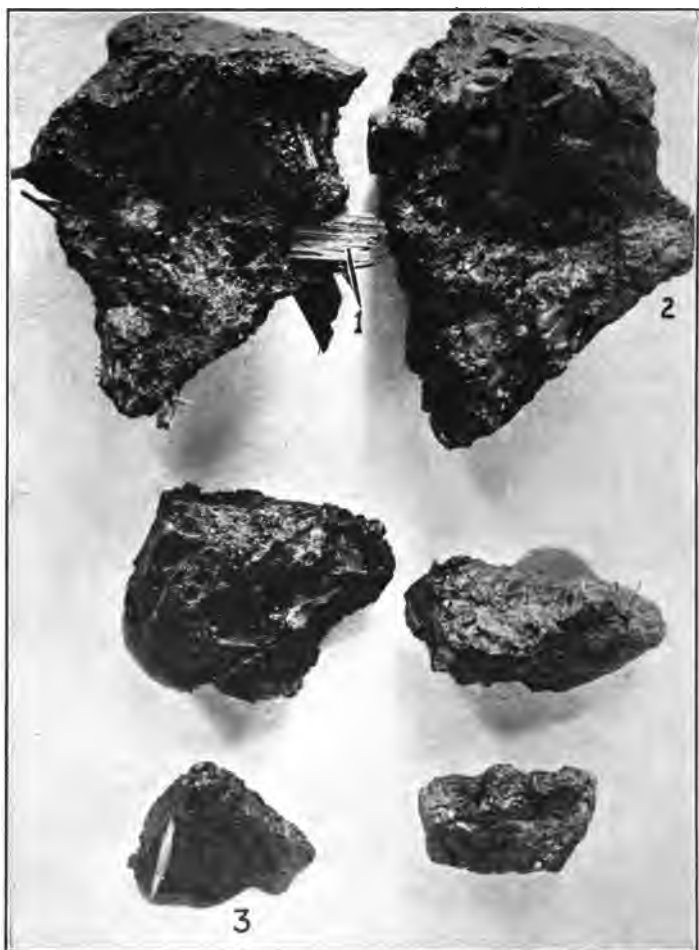
Mastic occurs as entire or broken tears. Mastic is a resin. The outline varies from globular to oblong-cylindrical. Mastic tears have a maximum length of 2 cm. and a maximum width of 12 mm. The texture is vitreous. The color is light greenish yellow. The surface is transparent, smooth and shiny. The fracture is even. The odor is not distinct. The taste is slightly pungent. Mastic becomes plastic when it is chewed.

Constituents: Volatile oil, resins, bitter principle, etc.

Dose: 2 Gm. (30 grains).

Preparations:

Pilulæ Aloes et Mastiches; Dose, 2 pills.



ASAFŒTIDA

1, Fragment of wood imbedded in mass. 2, 3, Irregular mass.

ASAFÆTIDA (Asafœt.) U. S. P.

English name: Asafetida.

Synonyms: Gum Asafetida.

Botanical origin: *Ferula Asafætida* Linné, *Ferula fætida* Regel and some other species of *Ferula*. (Fam. *Umbelliferæ*.)

Part used: Gum resin obtained by incising the rhizomes and roots.

Impurities: None given in U. S. P.

Assay: Not less than 60 per cent., or, if powdered, 50 per cent., of alcohol-soluble constituents.

Ash: Of gum-resin not more than 15 per cent.; of powder not over 30 per cent.

Habitat: Persia and Afghanistan.

Description:

Asafetida occurs as plastic or solid masses, rarely as tears. It is a gum resin. The outline of the masses is irregular. The size of the pieces is variable. The texture is waxy when the drug is hard. The color of the mass is usually a mixture of yellow, white, brown and red. The surface is mottled and uneven. The fracture is conchoidal. The odor is strongly aromatic and persistent. The taste is pungent, like garlic.

Constituents: Volatile oil, resin, gum, etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

Emulsum Asafætidiæ; Dose, 15 mils (4 fl. drs.).

Pilulæ Asafætidiæ; Dose, 2 pills.

Tinctura Asafætidiæ; Dose, 1 mil (15 min.).



CAMBOGIA

1, Solid cylinder. 2, Curved cylinder. 3, Cross-section of hollow cylinder. 4, Cross-section of solid cylinder.

CAMBOGIA (Cambog.) U. S. P.

English name: Gamboge.

Synonyms: Pipe Gamboge.

Botanical origin: *Garcinia Hanburii* Hooker filius.
(Fam. *Guttiferæ*.)

Part used: Gum-resin.

Impurities: None given in U. S. P.

Assay: Not less than 65 per cent. is soluble in alcohol.

Ash: Not more than 2 per cent.

Habitat: India, China and Siam.

Description:

Gamboge occurs as cylindrical, straight and curved pieces. Gamboge is a *gum-resin*. The *outline* of the pieces is oblong-cylindrical. The maximum length of the pieces is 18 cm., maximum width 4 cm. The *texture* is waxy. The *color* is orange brown; when abraded, lemon yellow; when moistened, milky, yellowish white. The *surface* is finely wrinkled or longitudinally striated. The *fracture* is conchoidal. The fractured surface is hollow or solid. The *odor* is not distinct. The *taste* is acrid.

Constituents: Gum, resin, volatile oil, acids, etc.

Dose: 0.125 Gm. (2 grains).

Preparations:

Pilulæ Catharticæ Compositæ; Dose, 2 pills.



MYRRHA

1, Rough and fissured surface. 2, Piece of bark. 3, Masses of variable size.

MYRRHA (Myrrh.) U. S. P.

English name: Myrrh.

Synonyms: Gum Myrrh.

Botanical origin: One or more species of *Commiphora*.
(Fam. *Burseraceæ*.)

Part used: Gum-resin.

Impurities: None given in U. S. P.

Assay: Not less than 35 per cent. is soluble in alcohol.

Ash: Not more than 8.5 per cent.

Habitat: Eastern Africa.

Description:

Myrrh occurs as irregular masses of agglutinated tears. Myrrh is a *gum-resin*. The *outline* of the pieces is irregular. The pieces have a maximum length or width of 12 cm. and a thickness of 8 cm. The *texture* is waxy. The *color* varies from light yellow to dark brown. The *surface* is dull, powdery and rough because of numerous projecting tears. The *fracture* is conchoidal. The *odor* is aromatic. The *taste* is pungent, bitter and acrid.

Constituents: Volatile oil, resin, gum, bitter principle, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Pilulæ Rhei Compositæ; Dose, 2 pills.

Tinctura Aloes et Myrrhæ N. F.; Dose, 2 mils (30 min.).

Tinctura Myrrhæ; Dose, 1 mil (15 min.).

BALSAMUM PERUVIANUM

(Bals. Peruv.) U. S. P.

English name: Balsam of Peru.

Synonyms: Peru Balsam.

Botanical origin: *Toluiifera Pereiræ* (Royle) Baillon.
(Fam. *Leguminosæ*.)

Part used: Balsam.

Impurities: None given in U. S. P.

Assay: Acid number not less than 56 nor more than 84. Saponification value for the cinnamein 235 to 238.

Ash: None stated in U. S. P.

Description:

Balsam of Peru occurs as a syrupy liquid; color reddish brown; odor agreeable and vanilla-like; taste bitter and acrid, with persistent after-taste; specific gravity 1.130 to 1.160 at 25° C.

Constituents: Cinnamein, benzoic and cinnamic acids, vanillin, styracin, resin, etc.

Dose: None given officially.

Preparations:

None.

BALSAMUM TOLUTANUM

(Bals. Tolu.) U. S. P.

English name: Balsam of Tolu.

Synonyms: Tolu Balsam.

Botanical origin: *Toluiifera Balsamum* Linné. (Fam. *Leguminosæ*.)

Part used: Entire balsam.

Impurities: None given in U. S. P.

Assay: Saponification value not less than 154 nor more than 220.

Ash: None given.

Description:

Balsam of Tolu occurs as a putty-like *plastic solid*; odor, vanilla-like; *taste*, mild and aromatic; becomes brittle when exposed to the air or when cooled sufficiently.

Constituents: Practically same as of balsam of Peru.

Dose: None given.

Preparations:

Syrupus Tolutanus; Dose, 15 mls (4 fl. drs.).
Tinctura Tolutana; Dose, 2 mls (30 min.).

STYRAX U. S. P.

English name: Storax.

Synonyms: Liquid Storax.

Botanical origin: *Liquidambar orientalis* Miller.
(Fam. *Hamamelidaceæ*.)

Part used:

Impurities: None given in U. S. P.

Assay: Residue insoluble in hot alcohol not over 2.5 per cent.; acid value not less than 56 nor more than 85; saponification value not less than 170 nor more than 230.

Ash: Not more than 1 per cent.

Description:

Storax occurs as a semi-liquid, sticky, opaque mass, depositing on standing a heavy, dark brown stratum; color grayish; odor characteristic; taste acrid.

Constituents: Resins, volatile oil, cinnamic acid and its esters, vanillin, resins, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Enters in Tinctura Benzoini Composita.

COPAIBA (Copaib.) U. S. P.

English name: Copaiba.

Synonyms: Balsam of Copaiba; Copaiva.

Botanical origin: South American species of *Copaiba*
(Fam. *Leguminosæ*.)

Part used: Oleoresin.

Impurities: None given in U. S. P.

Assay: Acid value not less than 28 nor more than 95;
resin content not less than 36 per cent.

Ash: None given.

Description:

Copaiba occurs as a viscid liquid; color brownish-yellow, occasionally with a slightly greenish fluorescence; odor aromatic; taste bitter and acrid; specific gravity 0.940 to 0.995 at 25° C.

Constituents: Volatile oil, resin, acids, etc.

Dose: 1 mil (15 min.).

Preparations:

Massa Copaibæ N. F.; Dose, 1 Gm. (15 grains).

Mistura Copaibæ N. F.; Dose, 8 mils (2 fl. drs.).

Mistura Copaibæ et Opii N. F.; Dose, 4 mils (1 fl. dr.).

PIX LIQUIDA (Pix. Liq.) U. S. P.

English name: Tar.

Synonyms: Pine Tar.

Botanical origin: *Pinus palustris* Miller, or other species of *Pinus*. (Fam. *Pinaceæ*.)

Part used:

Impurities: None stated in U. S. P.

Assay: None given.

Ash: None stated.

Description:

Tar occurs as a thick, syrupy liquid; color nearly black; odor aromatic; taste pungent and empyreumatic.

Constituents: Resin, turpentine, empyreumatic oils, creosote, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Glyceritum Picis Liquidæ N. F.; Dose, 4 mls (1 fl. dr.).

Liquor Picis Alkalinus N. F. (Used externally.)

Syrupus Picis Liquidæ; Dose, 4 mls (1 fl. dr.).

Unguentum Picis Liquidæ. (Used externally.)

Vinum Picis N. F.; Dose, 8 mls (2 fl. drs.).

TEREBINTHINA LARICIS

(Terebinth. Laric.) N. F.

English name: Venice Turpentine.

Synonyms: Larch Turpentine.

Botanical origin: *Larix Europæa* De Candolle. (Fam. *Pinacæ.*)

Part used: Viscid oleoresin.

Impurities: None given officially.

Assay: Acid number not more than 80.

Ash: None given.

Description:

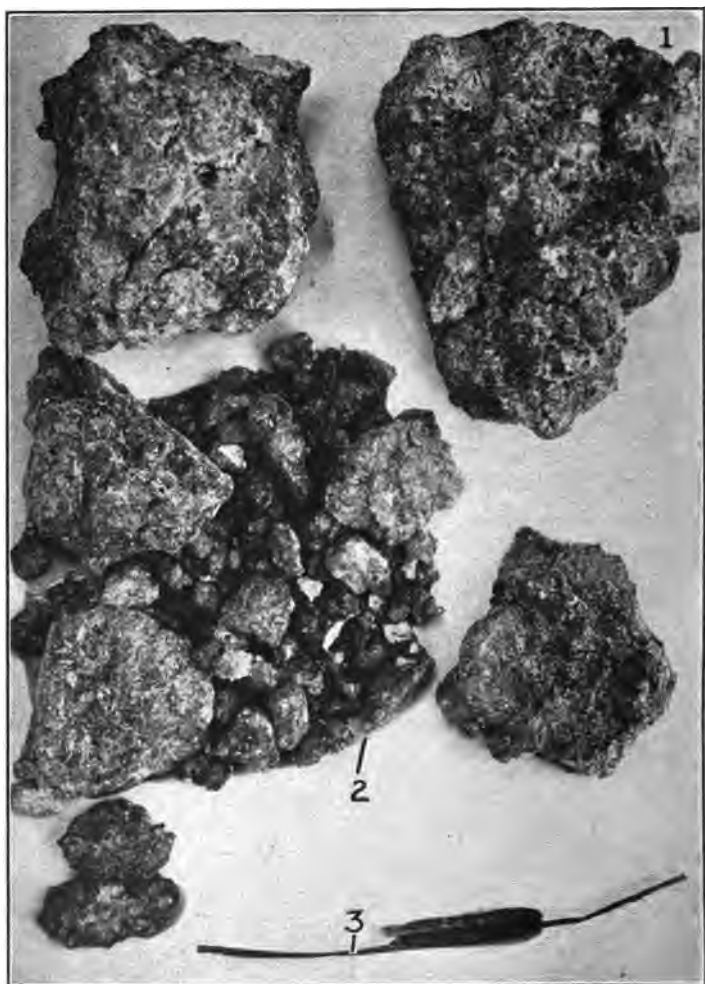
Venice turpentine *occurs* as a thick semi-liquid, heavier than water; *color* yellowish green; *odor* aromatic; *taste* bitter and pungent.

Constituents: Volatile oil, resin, etc.

Dose: None given.

Preparations:

Petroxolinum Terebinthinæ Laricis N. F. (Used externally.)



TEREBINTHINA

1, 2, Mass of turpentine. 3, Pine needle.

TEREBINTHINA (Terebinth.) N. F.

English name: Turpentine.

Synonyms: Common Turpentine, Gum Thus.

Botanical origin: *Pinus palustris* Miller and from other species of *Pinus*. (Fam. *Pinaceæ*.)

Part used: Concrete oleoresin.

Impurities: Not more than 2 per cent. of mechanical impurities.

Assay: Soluble in alcohol, ether, chloroform, or glacial acetic acid.

Ash: None given.

Habitat: Virginia, south to Florida and Texas.

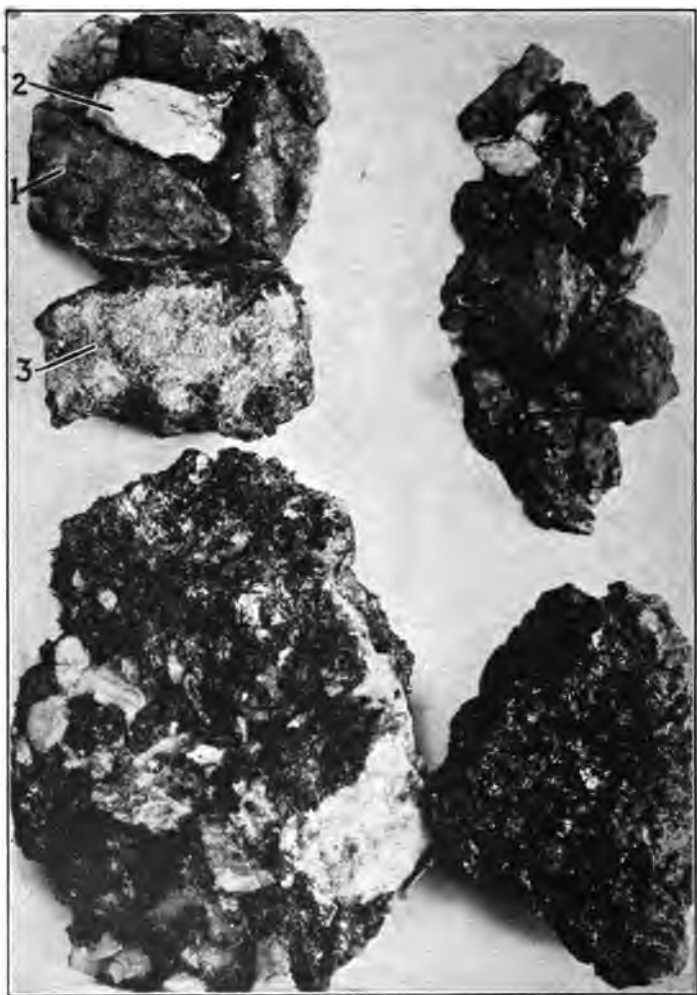
Description:

Turpentine occurs as irregular masses. The outline is irregular, the size is variable, and the texture is resinous. The color varies from yellowish white to yellow. The surface is opaque and uneven. The fracture is uneven. The odor is aromatic. The taste is pungent.

Dose: None stated officially.

Preparations:

None.



BENZOINUM

1. Brown tear. 2, White tear. 3, Adhering piece of burlap.

BENZOINUM (Benzoin.) U. S. P.

English name: Benzoin.

Synonyms: Gum Benzoin, Gum Benjamin.

Botanical origin: *Styrax Benzoin* Dryander and some other species of *Styrax* growing in the East Indies. (Fam. *Styracaceæ*.)

Part used: Balsamic resin.

Impurities: None given in U. S. P.

Assay: Not less than 75 per cent. of Sumatra and 90 per cent. of Siam benzoin dissolves in alcohol.

Ash: Not more than 2.5 per cent. in Sumatra benzoin and not over 2 per cent. in Siam benzoin.

Habitat: East Indies.

Description:

Benzoin occurs as large, square cakes, covered with burlap, or as separate tears and masses. The outline of the broken cakes and tears is irregular. The size is variable, the texture waxy. The color varies from white to yellow to reddish brown. In Sumatra benzoin the white tears are surrounded by a reddish brown mass. In Siam benzoin the tears are yellowish brown externally, yellowish white internally. The surface is rough. The fracture is uneven. The odor is aromatic. The taste is pungent and acrid.

Constituents: Benzoic acid, cinnamic acid, styracin, vanillin and resin.

Dose: 1 Gm. (15 grains).

Preparations:

Adeps Benzoinatus.

Tinctura Benzoini; Dose, 1 mil (15 min.).

Tinctura Benzoini Composita; Dose, 2 mils (30 min.).

CHAPTER XIX

LATEX, DRIED JUICES, EXTRACTS AND CAMPHORS

LATEX

THE three drugs consisting of dried latex are opium, lactucarium, and gutta-percha. All these differ greatly in appearance and in form.

Opium is obtained by cutting the poppy capsule and collecting, when dried, the milky juice. As the source of morphine, codeine, etc., opium is classed as one of the most important drugs of the Pharmacopœia.

Lactucarium is a dried milk juice occurring as small cakes of a brown or brownish black color.

Gutta-percha is the purified, coagulated, milky exudate of various trees.

DRIED JUICES

The official dried juices include kino and three varieties of aloes.

Kino occurs as small irregular fragments.

The different varieties of *aloes* are quite distinct in appearance, though supposed to be similar in properties.

EXTRACTS

Gambir, the only official extract, occurs as brownish black cubes or rectangular pieces of variable size. When broken, they are yellowish and powdery.

CAMPHORS

Camphor occurs as cakes of variable size. Its surface is glassy when freshly broken, and it is very aromatic.

OPIUM U. S. P.

English name: Opium.

Synonyms: Gum Opium, Meconium, Thebaica.

Botanical origin: *Papaver somniferum* Linné and its variety *album* De Cándolle. (Fam. *Papaveraceæ*.)

Part used: Milky exudation (latex).

Impurities: None given in U. S. P.

Assay: Not less than 9.5 per cent. of anhydrous morphine.

Ash: None given.

Habitat: Asia Minor and China; also cultivated.

Description:

Opium occurs as rounded masses, as rectangular cakes, or as large flat cakes. It is a solidified latex. The outline of the masses and cakes is variable. The size is variable. The texture is waxy. The color varies from brown to black. The outer surface frequently has adhering to it fragments of leaves and fruits of rumex. The fracture is uneven. The odor is narcotic. The taste is bitter.

Constituents: Alkaloids (morphine, codeine, narcotine, narceine, etc.), meconic acid, glucose, gum, pectin, caoutchouc, wax, coloring matter, etc.

Dose: 0.06 Gm. (1 grain).

Preparations:

Acetum Opii N. F.; Dose, 0.5 mil (8 min.).

Extractum Opii; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).

Linimentum Opii Compositum N. F.

Mistura Camphoræ Acida N. F.; Dose, 8 mls (2 fl. drs.).

Mistura Carminativa N. F.; Dose (infants') 0.5 mil (8 min.).

Mistura Glycyrrhizæ Composita; Dose, 10 mls (2½ fl. drs.).

Mistura Opii et Chloroformi Composita N. F.; Dose, 2 mls (30 min.).

Mistura Opii et Rhei Composita N. F.; Dose, 2 mls (30 min.).

Mistura Opii et Sassafras N. F.; Dose (infants'), 0.3 mil (5 min.).

Opii Pulvis; Dose, 0.06 Gm. (1 grain).

Opium Deodoratum; Dose, 0.06 Gm. (1 grain).

Opium Granulatum; Dose, 0.06 Gm. (1 grain).

Pilulæ Opii, Digitalis et Quininae N. F.; Dose, 1 pill.

Pilulæ Opii et Camphoræ N. F.; Dose, 1 pill.

Pilulæ Opii et Plumbi N. F.; Dose, 1 pill.

Pulvis Oretæ et Opii Aromaticus N. F.; Dose, 1 Gm. (15 grains).

Pulvis Ipecacuanhæ et Opii; Dose, 0.5 Gm. (8 grains).

Pulvis Kino et Opii Compositus N. F.; Dose, 1 Gm. (15 grains).

Syrupus Ipecacuanhæ et Opii N. F.; Dose, 4 mls (1 fl. dr.).

Tinctura Ipecacuanhæ et Opii N. F.; Dose, 0.5 mil (8 min.).

Tinctura Opii; Dose, 0.5 mil (8 min.).

Tinctura Opii Camphorata; Dose, 4 mls (1 fl. dr.).

Tinctura Opii Crocata N. F.; Dose, 0.6 mil (10 min.).

Tinctura Opii Deodorata; Dose, 0.5 mil (8 min.).

Tinctura Pectoralis N. F.; Dose, 0.6 mil (10 min.).



LACTUCARIUM

1. Under surface of cake. 2, Upper surface of cake.
3, Broken surfaces.

LACTUCARIUM (Lactucar.) U. S. P.

English name: Lactucarium.

Synonyms: Lettuce Opium.

Botanical origin: *Lactuca virosa* Linné. (Fam. *Compositæ*.)

Part used: Dried milk-juice (latex).

Impurities: None given in U. S. P.

Assay: Not more than 15 per cent. moisture.

Ash: Not more than 10 per cent.

Habitat: Central and Southern Europe; cultivated.

Description:

Lactucarium occurs as cakes of variable size. Lactucarium is a latex (milk-juice). The cakes have a maximum diameter of 5.5 cm. and a maximum thickness of 3 cm. The texture is waxy. The color varies from grayish red to reddish black. The fracture is uneven. The fractured surface varies from light gray to nearly black. The odor is aromatic. The taste is aromatic and bitter.

Constituents: Alkaloids (lactucine, hyoscyamine), bitter principles, wax, sugar, gum, pectin, resin, etc.

Dose: 1 Gm. (15 grains).

Preparations:

Syrupus Lactucarii (from Tincture); Dose, 10 mls (2½ fl. drs.).
Tinctura Lactucarii; Dose, 2 mls (30 min.).



GUTTA PERCHA

1, Oblong slice. 2, Rough surface. 3, Rod of purified gutta percha.

GUTTA PERCHA N. F.

English name: Gutta-percha.

Synonyms: Gutta Taban, Gummi Plasticum.

Botanical origin: Various trees of genus *Palaquium* Blanco. (Fam. *Sapotaceæ*.)

Part used: Milky exudate (latex).

Impurities: Not more than 10 per cent. of undissolved residue when dissolved in chloroform, oil turpentine, etc.

Assay: None given.

Ash: Not more than 5 per cent.

Habitat: East Indies, East Africa; cultivated.

Description:

Gutta-percha occurs as cakes, sheets, rods or as irregular pieces. It is a latex. The cakes, sheets and pieces are of variable size. The texture is like rubber. The color varies from yellowish white to grayish, usually with reddish streaks. The uncut surface is smooth, the cut surface rough and mottled. Gutta-percha has no fracture. There is no characteristic odor and taste.

Dose: None given.

Preparations:

Liquor Guttæ Perchæ. (Used externally.)

ELATERINUM (Elaterin.) U. S. P.

English name: Elaterin.

Synonyms: None.

Botanical origin: *Ecballium Elaterium* (Linné) A. Richard. (Fam. *Cucurbitaceæ*.)

Part used: Neutral principle.

Impurities: None given in U. S. P.

Assay: None given.

Ash: No ash from 0.1 Gm. of elaterin.

Habitat:

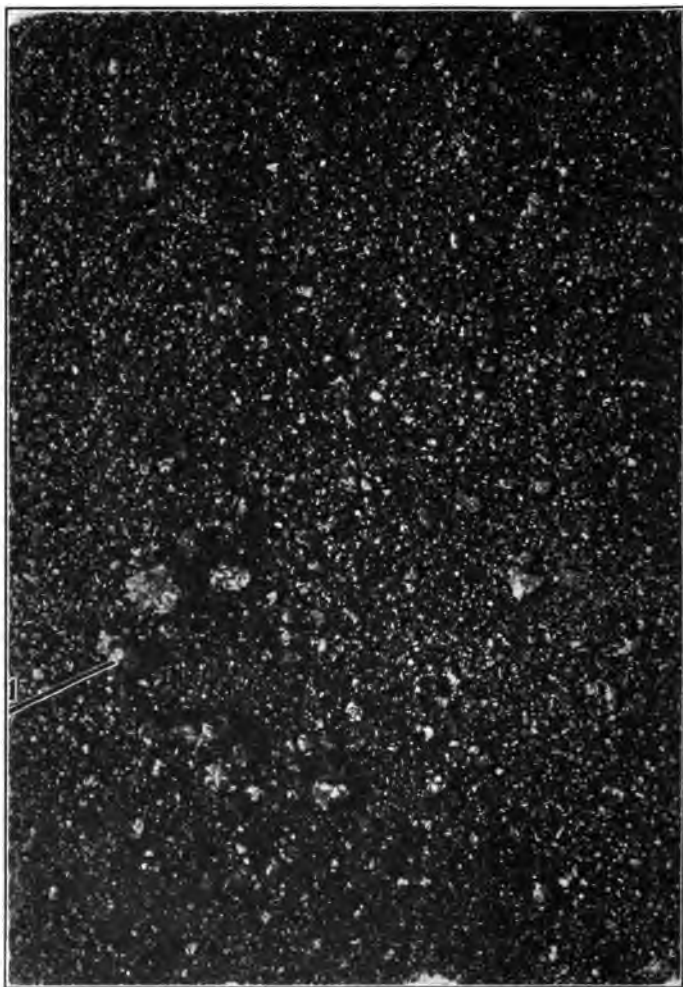
Description:

Elaterin occurs as a white powder or white crystals; the odor is not distinct; the taste is bitter and acrid.

Dose: 0.003 Gm. ($\frac{1}{20}$ grain).

Preparations:

Trituratio Elaterini; Dose, 0.03 Gm. ($\frac{1}{2}$ grain).



KINO

1, Angled fragments of variable size.

KINO U. S. P.

English name: Kino.

Synonyms: Gum Kino.

Botanical origin: *Pterocarpus Marsupium* Roxburgh.
(Fam. *Leguminosæ*.)

Part used: Spontaneously dried juice.

Impurities: None given in U. S. P.

Assay: Not less than 45 per cent. of alcoholic extractive; not more than 12 per cent. moisture.

Ash: Not more than 3 per cent.

Habitat: India and Ceylon.

Description:

Kino occurs as small, angled fragments. Kino is a dried juice. The fragments rarely exceed 10 mm. in length or width. The color varies from reddish black to black. The surface is angled and shiny. The fracture is conchoidal. The odor is not distinct. The taste is very strongly astringent.

Constituents: Kinotannic acid and other principles, coloring matter, gum, etc.

Dose: 0.5 Gm. (8 grains).

Preparations:

Pulvis Kino et Opii Compositus N. F.; Dose, 1 Gm. (15 grains).
Tinctura Kino; Dose, 4 mls (1 fl. dr.).
Tinctura Kino et Opii Composita N. F.; Dose, 4 mls (1 fl. dr.).



ALOE (SOCOTRINE)

1, Fragment of mass. 2, Broken surface.

ALOE U. S. P.

(1) Socotrine Aloes

English name: Aloes.

Synonyms: Socotrine Aloes.

Botanical origin: *Aloe Perryi* Baker. (Fam. *Liliaceæ*.)

Part used: Inspissated juice of the leaves.

Impurities: None given in U. S. P.

Assay: Not less than 50 per cent. soluble in cold water.

Ash: Not more than 4 per cent.

Habitat: Africa, West Indies and Barbados Islands.

Description:

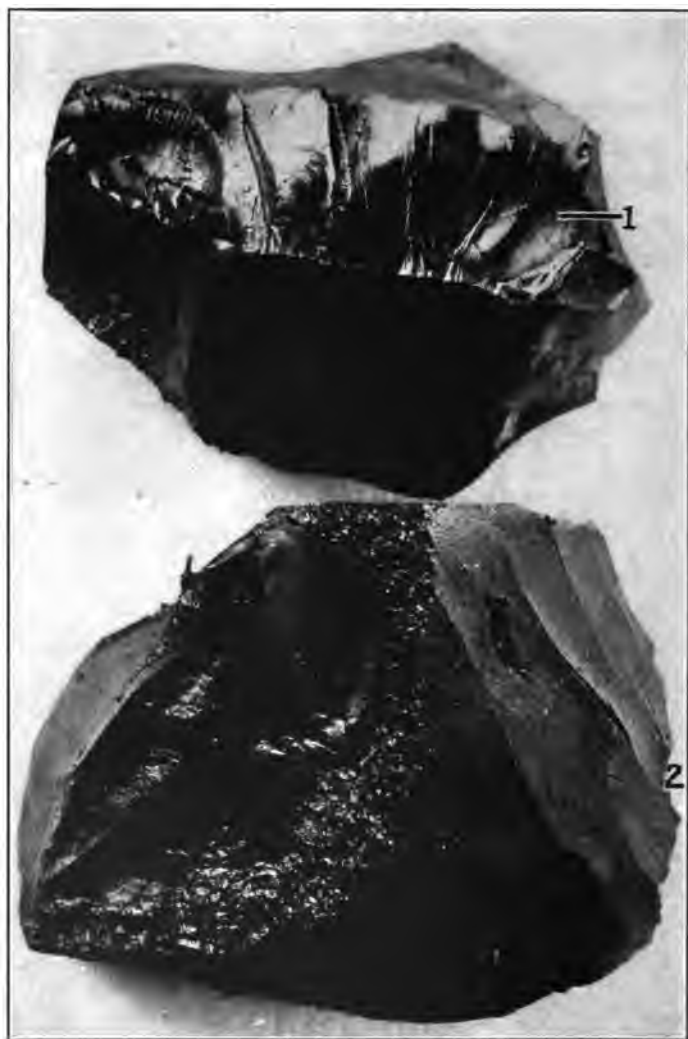
Socotrine Aloes occurs as masses packed in boxes or in animal skins. Socotrine aloes is an inspissated juice. The outline of the broken pieces is irregular. The texture is waxy. The color varies from a light to a dark yellowish brown. The surface is dull or slightly shiny. The fracture is conchoidal. The odor is aromatic. The taste is very strongly bitter and pungent.

Constituents: Aloin, emodin, resin, volatile oil, etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

Extractum Aloes N. F.; Dose, 0.125 Gm. (2 grains).
Extractum Colocyntidis Compositum; Dose, 0.25 Gm. (4 grains).
Pilulæ ad Prandium N. F. (4 kinds); Dose, 1 pill.
Pilulæ Aloes; Dose, 2 pills.
Pilulæ Aloes et Asafetidæ N. F.; Dose, 1 pill.
Pilulæ Aloes et Ferri N. F.; Dose, 2 pills.
Pilulæ Aloes et Mastiches N. F.; Dose, 2 pills.
Pilulæ Aloes et Myrrhæ N. F.; Dose, 2 pills.
Pilulæ Aloes et Podophylli Compositæ N. F.; Dose, 1 pill.
Pilulæ Aloes, Hydrargyri et Podophylli N. F.; Dose, 1 pill.
Pilulæ Aloes, Hydrargyri et Scammoniae Compositæ N. F.; Dose, 1 pill.
Pulvis Aloes et Canellæ N. F.; Dose, 0.3 Gm. (5 grains).
Tinctura Aloes; Dose, 2 mls (30 min.).
Tinctura Aloes et Myrrhæ N. F.; Dose, 2 mls (30 min.).
Tinctura Benzoini Composita; Dose, 2 mls (30 min.).



ALOE (CURAÇAO)

1, 2, Two fragments of a large cake.

ALOE U. S. P.

(2) Curaçao Aloes

English name: Aloes.

Synonyms: Curaçao Aloes. •

Botanical origin: *Aloe vera* Linné. (Fam. *Liliaceæ*.)

Part used: Inspissated juice of the leaves.

Impurities: None given in U. S. P.

Assay: Not less than 60 per cent. soluble in cold water.

Ash: Not more than 4 per cent.

Habitat: Africa, West Indies and Barbados Islands.

Description:

Curaçao Aloes occurs as solidified masses packed in boxes or large gourds. Curaçao aloes is an inspissated juice. The outline of the broken pieces is irregular. The size of the pieces is variable. The texture is waxy. The color varies from orange brown to blackish brown. The surface is dull and smooth. The fracture is conchoidal. The odor is strongly aromatic. The taste is very strongly bitter and pungent.

Constituents: Aloin, emodin, resin, volatile oil, etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

Extractum Aloes N. F.; Dose, 0.125 Gm. (2 grains).
Extractum Colocynthis Compositum; Dose, 0.25 Gm. (4 grains).
Pilulæ ad Prandium N. F. (4 kinds); Dose, 1 pill.
Pilulæ Aloes; Dose, 2 pills.
Pilulæ Aloes et Asafetidæ N. F.; Dose, 1 pill.
Pilulæ Aloes et Ferri N. F.; Dose, 2 pills.
Pilulæ Aloes et Mastiches N. F.; Dose, 2 pills.
Pilulæ Aloes et Myrrhæ N. F.; Dose, 2 pills.
Pilulæ Aloes et Podophylli Compositæ N. F.; Dose, 1 pill.
Pilulæ Aloes, Hydrargyri et Podophylli N. F.; Dose, 1 pill.
Pilulæ Aloes, Hydrargyri et Scammonis Compositæ N. F.; Dose, 1 pill.
Pulvis Aloes et Canellæ N. F.; Dose, 0.3 Gm. (5 grains).
Tinctura Aloes; Dose, 2 mls (30 min.).
Tinctura Aloes et Myrrhæ N. F.; Dose, 2 mls (30 min.).
Tinctura Benzoini Composita; Dose, 2 mls (30 min.).



ALOE (CAPE)

1, 2, Two fragments of a large cake.

ALOE U. S. P.

(3) Cape Aloe

English name: Aloes.

Synonyms: Cape Aloe.

Botanical origin: *Aloe ferox* Miller. (Fam. *Liliaceæ*.)

Part used: Inspissated juice.

Impurities: None given.

Assay: Not less than 60 per cent. soluble in cold water; contains not more than 10 per cent. moisture.

Ash: Not more than 4 per cent.

Habitat: Africa, West Indies and Barbados Islands.

Description:

Cape Aloe occurs as solidified masses packed in boxes. Cape aloes is an inspissated juice. The outline of the broken pieces is irregular. The size of the pieces is variable. The texture is vitreous. The color is dark green. The surface is shiny and divided by fissures into numerous slightly adhering fragments. The fracture is even. The odor is strongly aromatic. The taste is very strongly bitter and pungent.

Constituents: Aloin, emodin, resin, volatile oil, etc.

Dose: 0.25 Gm. (4 grains).

Preparations:

Extractum Aloes N. F.; Dose, 0.125 Gm. (2 grains).
Extractum Colocynthis Compositum; Dose, 0.25 Gm. (4 grains).
Pilula ad Prandium N. F. (4 kinds); Dose, 1 pill.
Pilula Aloes; Dose, 2 pills.
Pilula Aloes et Asafetida N. F.; Dose, 1 pill.
Pilula Aloes et Ferri N. F.; Dose, 2 pills.
Pilula Aloes et Mastiches N. F.; Dose, 2 pills.
Pilula Aloes et Myrrha N. F.; Dose, 2 pills.
Pilula Aloes et Podophylli Composita N. F.; Dose, 1 pill.
Pilula Aloes, Hydrargyri et Podophylli N. F.; Dose, 1 pill.
Pilula Aloes, Hydrargyri et Scammonia Composita N. F.; Dose, 1 pill.
Pulvis Aloes et Canella N. F.; Dose, 0.3 Gm. (5 grains).
Tinctura Aloes; Dose, 2 mls (30 min.).
Tinctura Aloes et Myrrha N. F.; Dose, 2 mls (30 min.).
Tinctura Benzoini Composita; Dose, 2 mls (30 min.).



GAMBIR

1, Five nearly square cakes. 2, Rectangular cake. 3, Out surface.

GAMBIR U. S. P.

English name: Gambir.

Synonyms: Pale Catechu.

Botanical origin: Leaves and twigs of *Ourouparia Gambir* (Hunter) Baillon. (Fam. *Rubiaceæ*.)

Part used: Dried extract.

Impurities: None given in U. S. P.

Assay: Not less than 65 per cent. soluble in water, 60 per cent. soluble in alcohol.

Ash: Not more than 9 per cent.

Habitat: East India Islands.

Description:

Gambir occurs as cubical or rectangular pieces. Gambir is an extract. The maximum length of the rectangular pieces is 4 cm., the maximum width is 3 cm. The color varies from yellowish brown to black. The texture is starchy. The surface is sunken and frequently striated. The fracture is uneven. The fractured surface is dull and yellowish or grayish brown. The odor is not distinct. The taste is bitter and very strongly astringent.

Constituents: Catechutannic acid, catechin, gum, extractive, quercetin, etc.

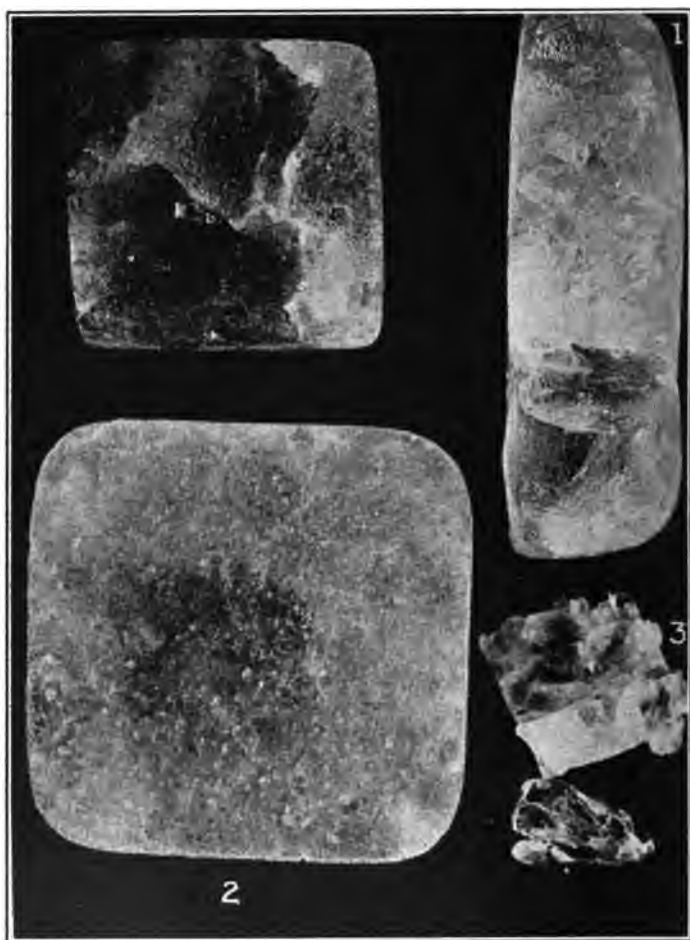
Dose: 1 Gm. (15 grains).

Preparations:

Pulvis Gambir Compositus N. F.; Dose, 1.3 Gm. (20 grains).

Tinctura Gambir Composita; Dose, 4 mls (1 fl. dr.).

Trochisci Gambir N. F.; Dose, 1 troche.



CAMPHORA

1, 2, 3, Cakes and fragments of camphor.

CAMPHORA (Camph.) U. S. P.

English name: Camphor.

Synonyms: Gum Camphor.

Botanical origin: *Cinnamomum Camphora* (Linné)
Nees et Ebermaier. (Fam. *Lauraceæ*.)

Part used: Ketone.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 0.05 per cent.

Habitat: China and Japan; cultivated in Southern United States.

Description:

Camphor occurs as cakes or as broken pieces. Camphor is a ketone. The size of the cake is variable. The color is grayish white. The texture is waxy. The surface is rough, crystalline and fissured. The fracture is uneven. The fractured surface is angled, shiny and transparent. The odor is aromatic. The taste is pungent.

Dose: By mouth, 0.2 Gm. (3 grains). Hypodermic, 0.1 Gm. (1½ grains).

Preparations:

Aque Camphoræ; Dose, 10 mils (2½ fl. drs.).

Ceratum Camphoræ N. F.

Emplastrum Fuscum N. F.

Linimentum Belladonnæ.

Linimentum Camphoræ.

Linimentum Chloroformi.

Linimentum Saponis.

Mistura Camphoræ Acida N. F.; Dose, 8 mils (2 fl. drs.).

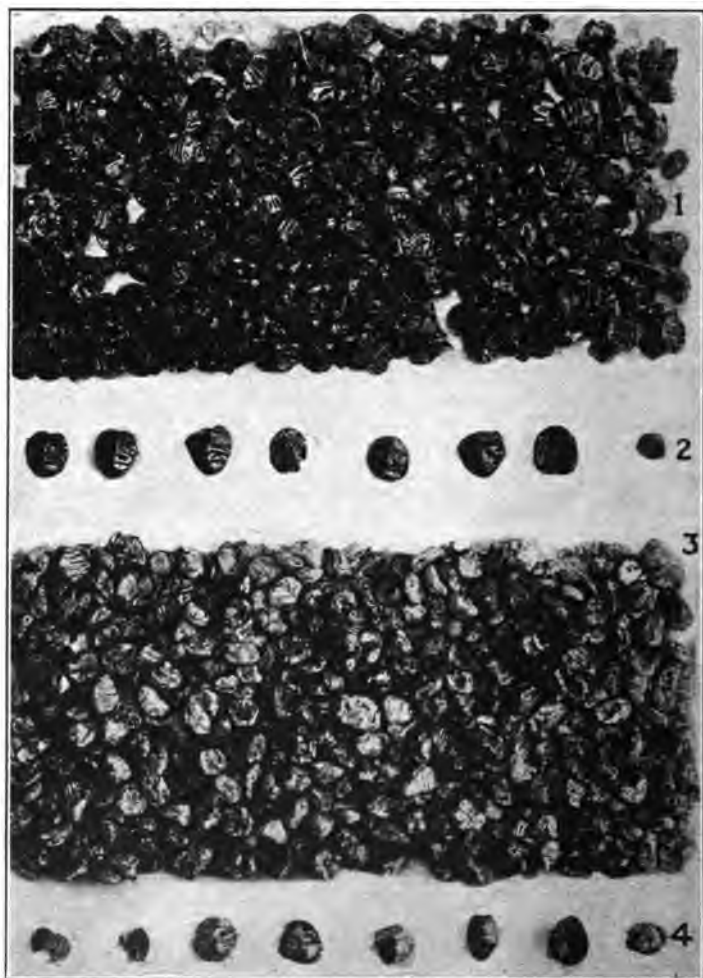
Mistura Camphoræ Aromatica N. F.; Dose, 8 mils (2 fl. drs.).

Spiritus Camphoræ; Dose, 1 mil (15 min.).

Tinctura Opii Camphorata; Dose, 4 mils (1 fl. dr.).

Unguentum Camphoræ N. F.

Unguentum Fuscum N. F.



COCCUS

1, 2, Black cochineal (unofficial). 3, 4, The official silvered cochineal.

CHAPTER XX

DRUGS OF ANIMAL ORIGIN

THE drugs of animal origin vary so much that no one set of characters will cover all the different drugs, therefore the introduction to this group is omitted. Each drug, however, is minutely described in the following pages of the text.

Coccus, *cantharides* and *gelatin* are of animal origin.

Coccus is collected in Mexico from cactus plants. Only the bugs covered with the natural wax are official.

Cantharides is a beetle, very characteristic in structure and having well known properties.

Gelatin is an animal mucilage prepared from bones. It is used largely as an adhesive agent, etc.

COCCUS U. S. P.

English name: Cochineal.

Synonyms: Coccionella.

Entomological origin: *Coccus cacti* Linné. (Fam. *Coccidæ*.)

Part used: Dried female insect.

Impurities: None given in U. S. P.

Assay: None given.

Ash: Not more than 6 per cent.

Habitat: On species of cacti growing in Mexico.

Description:

Coccus occurs as entire or broken pieces. *Coccus* is an insect. It has a maximum length of 6 mm. and a maximum width of 6 mm. The texture is waxy. The color varies from gray to grayish purple. The upper surface is convex-channeled. The under surface is concave and has numerous larvæ. The odor is not distinct. The taste is bitter.

Constituents: Carminic acid (carmine red), wax (coccerin), fixed oil, fats, gum, etc.

Preparations:

Liquor Cocci N. F. (For coloring.)



CANTHARIS

1, Mass of beetles. 2, Large beetles. 3, Small beetle.
4, Under surface of a beetle.

CANTHARIS U. S. P.

English name: Cantharides.

Synonyms: Spanish Flies, Russian Flies.

Entomological origin: *Cantharis vesicatoria* (Linné)
DeGeer. (Fam. *Meloideæ*, order *Coleoptera*.)

Part used: Dried beetles.

Impurities: None given in U. S. P.

Assay: Not less than 0.6 per cent. of cantharidin nor
more than 10 per cent. of moisture.

Ash: Not more than 9 per cent.

Habitat: Europe and Asia.

Description:

Cantharides occurs as entire and as broken pieces. *Cantharides* is a beetle. *Cantharides* has a maximum length of 25 mm. and a maximum width of 8 mm. The color varies from bluish green to yellowish green. The outline is oblong; the body is vertically compressed. The head is triangular and separated by a groove into two divisions. The eyes are small and lateral. The prothorax is angulate. The neck is distinct. The antennæ are thread-like and 11-jointed. The mandibles are short and thick. There are three pairs of legs and each leg is 5-jointed except the last pair, which is 4-jointed and covered with white unicellular hairs. The wing sheaths are longitudinally grooved, and they usually inclose the brown wings. The odor is aromatic. The taste is pungent and acrid.

Constituents: Cantharidin, fat, oil, volatile principle, chlorophyl, phosphates, acids, etc.

Preparations:

Ceratum Cantharidis.

Collodium Cantharidatum.

Emplastrum Cantharidis.

Tinctura Cantharidis; Dose, 0.1 mil (1½ min.).



CETACEUM

Fragment of large cake.

CETACEUM (Cetac.) U. S. P.

English name: Spermaceti.

Synonyms: None.

Origin: *Physeter macrocephalus* Linné. (Fam. *Physeteridæ*.) Sperm Whale.

Part used: Concrete fatty substance from the head.

Impurities: None given in U. S. P.

Assay: Specific gravity 0.938 to 0.944 at 25° C.; dissolves completely in 50 parts of boiling alcohol.

Ash: None given officially.

Description:

White or yellowish-gray cakes; when freshly broken the surface is opaque, crystalline and slightly shiny; odor very slight; taste not distinct; becomes yellowish and rancid on exposure.

Constituents: Cetin; esters of laurinic, stearic and myristic acids; etc.

Dose: Not used internally; only pharmaceutically.

Preparations:

None; ingredient of cerates, etc.



CERA FLAVA

Fragment of wax.

CERA FLAVA (Cer. Flav.) U. S. P.

English name: Yellow Wax.

Synonyms: Beeswax.

Entomological origin: *Apis mellifera* Linné. (Fam. *Apidæ*.)

Part used: Wax from the honeycomb.

Impurities: None stated in U. S. P.

Assay: Specific gravity 0.950 to 0.960 at 25°C.; melting-point 62° to 65° C.; ester value not less than 72 nor more than 77.

Ash: None given officially.

Description:

Cakes of variable size and form, according to container in which it was cooled; *color* yellowish or yellowish brown; *odor* aromatic, honey-like; *taste* bland and slightly pungent.

Constituents: Cerin, ceryl alcohol, mèlissic acid, myricin, aromatic and coloring matters, etc.

Dose: Not used internally.

Preparations:

Cera Alba. (Used pharmaceutically and technically.)

MEL U. S. P.

English name: Honey.

Synonyms: None.

Entomological origin: *Apis mellifera* Linné. (Fam. *Apidae*.)

Part used: Saccharine secretion.

Impurities: None permitted.

Assay: Specific gravity not less than 1.370.

Ash: Not more than 0.3 per cent.

Description:

Honey is a viscid liquid of a yellowish color. Upon standing it becomes crystalline. The odor is aromatic. The taste is sweet.

Constituents: Coloring matter, formic acid, wax, dextrose, levulose, gum, etc.

Dose: None given.

Preparations:

Mel Depuratum.

DIASTASUM U. S. P.

English name: Diastase.

Synonyms: Diastase of Malt.

Origin: Malt.

Part used: A mixture containing amylolytic enzymes.

Impurities: None mentioned in U. S. P.

Assay: Converts not less than 50 times its weight of potato starch into sugars in 30 minutes.

Ash: None stated in U. S. P.

Description:

Yellowish white, amorphous powder, or scales; odor and taste not distinct.

Constituents: Amylolytic enzymes of undefined nature.

Dose: 0.5 Gm. (8 grains).

Preparations:

None.

FEL BOVIS U. S. P.

English name: Ovgall.

Synonyms: Ox Bile.

Origin: *Bos taurus* Linné. (Fam. *Bovidae*.)

Part used: Entire secretion.

Impurities: None given in U. S. P.

Assay: None given.

Ash: None stated officially.

Description:

Dark, brownish green liquid; when shaken with water it becomes frothy; specific gravity, 1.015 to 1.025 at 25° C.

Constituents: Glycocholates and taurocholates of sodium and potassium; the bile-pigments bilirubin and biliverdin; fat, soaps, mucin, albuminous matter, choline, cholesterin, traces of urea, potassium, sodium, calcium and magnesium phosphates, potassium and sodium chlorides, iron, manganese and silica.

Dose: None given; not used so much.

Preparations:

Extractum Fellis Bovis; Dose, 0.1 Gm. (1½ grains).

PIX LITHANTHRACIS (Pix Lith.) N. F.

English name: Coal Tar.

Synonyms: Pix Carbonis.

Origin: From coal.

Part used: By-product in the manufacture of illuminating gas.

Impurities: None given officially.

Assay: None given.

Ash: Not more than 2 per cent.

Description:

Black, thick liquid or *semi-solid*; heavier than water; odor aromatic, naphthalene-like; taste strongly pungent.

Dose: Not used internally.

Preparations:

Liquor Picis Carbonis N. F. (Used externally.)

SUPRARENALUM SICCUM

(Supraren. Sicc.) U. S. P.

English name: Dried Suprarenals.

Synonyms: Desiccated Suprarenal Glands.

Origin: Animals used for food by man.

Part used: Whole fresh glands, cleaned, dried, freed from fat, and powdered. One part represents 6 parts of fresh gland.

Impurities: None given in U. S. P.

Assay: Biological; 1 Gm. contains the equivalent of 10 milligrams of lævo-methylamino-ethanol-catechol. Must not contain more than 7 per cent. of moisture.

Ash: Not more than 7 per cent.

Description:

Yellowish brown, amorphous powder; odor slightly aromatic; taste slight.

Constituents: Epinephrine (suprarenine) and other principles.

Dose: 0.25 Gm. (4 grains).

Preparations:

None.

PARAFFINUM (Paraff.) U. S. P.

English name: Paraffin.

Synonyms: Hard Paraffin, Paraffin Wax.

Origin: Petroleum.

Part used: Mixture of solid hydrocarbons.

Impurities: None given in U. S. P.

Assay: Specific gravity about 0.900 at 25°C.; melts at 50° to 57° C.

Ash: None given officially.

Description:

Grayish white solid; odor and taste not distinct; slightly greasy to the touch.

Constituents: Solid hydrocarbons.

Dose: Not used internally.

Preparations:

None.

SEVUM PRÆPARATUM (Sev. Præp.) U. S. P.

English name: Prepared Suet.

Synonyms: Mutton Suet.

Origin: *Ovis aries* Linné. (Fam. *Bovidae*.)

Part used: Purified internal fat of the abdomen of sheep.

Impurities: Rancid fat must not be used.

Assay: Melts between 45° and 50° C.; congeals between 37° and 40° C.; saponification value not less than 193 nor more than 200; iodine value not less than 33 nor more than 48.

Ash: None given.

Description:

White, *solid* fat; *odor* nearly wanting, not distinct; *taste* bland when fresh but becoming rancid on prolonged exposure.

Constituents: Stearin, palmitin, olein, etc.

Dose: Used only pharmaceutically.

Preparations:

Sevum Benzoinatum N. F. (Ointment base.)

HYPOPHYSIS SICCA (Hypophysis Sic.) U. S. P.

English name: Desiccated Hypophysis.

Synonyms: Desiccated Pituitary Body.

Origin: Cattle.

Part used: Posterior lobe from pituitary body of cattle, cleaned, dried and powdered.

Impurities: None given in U. S. P.

Assay: None given officially.

Ash: None stated.

Description:

Yellowish or grayish, amorphous *powder*; *odor* peculiar; *taste* not distinctive; only partially soluble in water.

Constituents: Not definitely determined.

Dose: 0.03 Gm. ($\frac{1}{2}$ grain).

Preparations:

Liquor Hypophysis; Dose, 1 mil (15 min.).

PETROLATUM LIQUIDUM (Petrolat. Liq.) U. S. P.

English name: Liquid Petrolatum, . . .

Synonyms: Mineral Oil, Liquid Paraffin.

Origin: From petroleum.

Part used: Natural mixture of liquid hydrocarbons.

Impurities: None mentioned in U. S. P.

Assay: Specific gravity 0.828 to 0.905 at 25°C. The *light* liquid petrolatum has a viscosity of not more than 3, *heavy* liquid petrolatum not less than 3.1.

Ash: None given officially.

Description:

Colorless, transparent, oily liquid; *odorless; tasteless.*

Constituents: Liquid hydrocarbons.

Dose: 15 mls (4 fl. drs.).

Preparations:

Petroxolinum Liquidum N. F. (Used as vehicle externally.)

Petroxolinum Spissum N. F. (Ointment base.)

PETROLATUM (Petrolat.) U. S. P.

English name: Petrolatum.

Synonyms: Petroleum Jelly, Petrolatum Ointment.

Origin: Petroleum.

Part used: Purified natural mixture of semi-solid hydrocarbons.

Impurities: None stated in U. S. P.

Assay: Specific gravity 0.820 to 0.865 at 60°C.; melting-point 38° to 54° C.

Ash: None mentioned officially.

Description:

Yellow to light amber, unctuous *mass*; *odor* and *taste* very faint.

Constituents: Semi-solid hydrocarbons.

Dose: Used externally and as ointment base.

Preparations:

Emulsum Petrolati N. F.; Dose, 15 mls (4 fl. drs.).

Petrolatum Album. (Used externally and pharmaceutically.)

ADEPS U. S. P.

English name: Lard.

Synonyms: Prepared Lard.

Origin: *Sus scrofa* var. *domestica* Gray. (Fam. *Suidæ*.)

Part used: Purified internal fat of the abdomen.

Impurities: None stated in U. S. P.

Assay: Iodine value not less than 46 nor more than 70; saponification value not less than 195 nor more than 203.

Ash: None stated.

Description:

Soft, white unctuous *solid*; odor slight; taste bland and not distinct; melts between 36° and 42° C.; gets rancid on keeping.

Constituents: Stearin, olein, palmitin, etc.

Dose: Used pharmaceutically and in the household.

Preparations:

Adeps Benzoinatus. (Used externally and pharmaceutically.)

ADEPS LANÆ (Adeps Lan.) U. S. P.

English name: Wool Fat.

Synonyms: Anhydrous Lanolin.

Origin: *Ovis aries* Linné. (Fam. *Bovidæ*.)

Part used: Purified sheep's-wool fat.

Impurities: None given in U. S. P.

Assay: Iodine value not less than 18 nor more than 28.

Ash: Not more than 0.1 per cent.; not alkaline to litmus paper.

Description:

Light yellow stringy (when pulled), tenacious, unctuous *mass*; odor faint; melts between 38° and 42° C.

Constituents: Free fatty acids, fatty acid esters of cholesterin and other alcohols.

Dose: Used externally only.

Preparations:

Adeps Lanæ Hydrosus. (Used externally and pharmaceutically.)

MOSCHUS (Mosch.) U. S. P.

English name: Musk.

Synonyms: Tonquin Musk, Deer Musk.

Origin: *Moschus moschiferus* Linné. (Fam. *Moschidæ*.)

Part used: Dried secretion from the preputial follicles.

Assay: Not more than 15 per cent. of moisture; not less than 50 per cent. is soluble in water and 10 per cent. in alcohol.

Ash: Not more than 8 per cent.

Habitat:

Description:

Small, blackish, irregular granules; glistening and somewhat oily; odor peculiar, powerful and persistent; taste somewhat bitter.

Constituents: Volatile odorous substances; cholesterolin, fat, wax, gelatinous and albuminous compounds; salts.

Dose: 0.25 Gm. (4 grains).

Preparations:

Tinctura Moschi; Dose, 4 mls (1 fl. dr.).

PANCREATIN (Pancreat.) U. S. P.

English name: Pancreatin.

Synonyms: None..

Origin: *Sus scrofa* var. *domestica* Gray (Fam. *Suidæ*); or *Bos taurus* Linné (Fam. *Bovidæ*).

Part used: Mixture of enzymes.

Impurities: None stated in U. S. P.

Assay: Converts not less than 25 times its weight of starch into soluble carbohydrates.

Ash: None stated officially.

Description:

Cream colored amorphous powder; odor faint, aromatic; taste peculiar.

Constituents: The enzymes trypsin, amyllopsin, steapsin, myopsin and rennin.

Preparations:

Liquor Pancreatini N. F.; Dose, 4 mls (1 fl. dr.).

Pulvis Pancreatini Compositus N. F. (Used for peptonizing milk.)

THYROIDUM SICCCUM (Thyroid. Sicc.) U. S. P.

English name: Dried Thyroids.

Synonyms: Desiccated Thyroid Glands.

Origin: Animals used for food by man.

Part used: Whole gland, freed from connective tissue and fat, dried and powdered.

Impurities: None given in U. S. P.

Assay: Not less than 0.17 per cent. nor more than 0.23 per cent. of iodine in thyroid combination. Must not contain more than 6 per cent. moisture.

Ash: Must not exceed 5 per cent.

Description:

Yellowish, amorphous powder; slightly aromatic; taste distinctive. One part represents five parts of fresh gland.

Constituents: Iodine organically combined.

Dose: 0.1 Gm. (1½ grains).

Preparations:

None.

RENNINUM N. F.

English name: Rennin.

Synonyms: None in common use.

Origin: *Bos taurus* Linné. (Fam. *Bovidae*.)

Part used: Milk-curdling enzyme from the stomach of the calf.

Impurities: None given officially.

Assay: Coagulates not less than 25,000 times its own weight of fresh milk.

Ash: None stated.

Description:

Grayish yellow powder or scales; odor slightly aromatic; taste slightly saline; slightly hygroscopic; deteriorates rapidly on keeping.

Constituents: Enzymes of undefined composition.

Dose: None given officially.

Preparations:

Elixir Pepsini et Rennini Compositum N. F.; Dose, 8 mls (2 fl. drs.).



Insect Flowers, 400 lbs. Always wired and in same style package.

GLOSSARY OF BOTANICAL TERMS

[Definitions derived from various authorities:

Gray, Kraemer, Mansfield]

- Acaulescent.** Stemless or apparently so, or with stem subterranean.
- Achene.** A small dry and hard 1-celled, 1-seeded, indehiscent fruit.
- Acuminate.** Tapering at the end.
- Acute.** Terminating with a sharp or well defined angle.
- Adnate.** United, as the inferior ovary with the calyx-tube. **Adnate**
Anther, one attached for its whole length to the inner or outer face of the filament.
- Æstivation.** The arrangement of the parts of the perianth in the bud.
- Albumen.** Any deposit of nutritive material accompanying the embryo.
- Alliaceous.** Having the smell or taste of garlic.
- Alternate** (of leaves, etc.). Not opposite to each other on the axis, but arranged singly at different heights.
- Ament.** A catkin, or scaly spike.
- Amphitropous** (ovule or seed). Half-inverted and straight, with the hilum lateral.
- Anastomosing.** Connecting by cross-veins and forming a network.
- Andræcium.** Aggregate of stamens in the flower.
- Androgynous** (inflorescence). Composed of both staminate and pistillate flowers.
- Angiospermous.** Having the seeds borne within a pericarp.
- Annular.** In the form of a ring.
- Anther.** The polleniferous part of a stamen.
- Apetalous.** Having no petals.
- Apothecia.** Disk-like or cup-shaped bodies on the surface of the thallus.
- Appressed.** Lying close and flat against.
- Aril.** An appendage growing at or about the hilum of a seed.
- Articulate.** Jointed; having a node or joint.
- Attenuate.** Slenderly tapering; becoming very narrow.
- Auricle.** An ear-shaped appendage.
- Awn.** A bristle-shaped appendage.
- Axil.** The angle formed by a leaf or branch with the stem.
- Axis.** The central line of any organ or support of a group of organs; a stem, etc.
- Barbed.** Furnished with rigid points or short bristles, usually reflexed like the barb of a fish-hook.
- Bast Fibers.** Strengthening cells of the cortex.
- Bearded.** Bearing a long awn, or furnished with long or stiff hairs.
- Berry.** A fruit the whole pericarp of which is fleshy or pulpy.
- Biennial.** Of two years' duration.
- Bifid.** Two-cleft.
- Bilabiate.** Two-lipped.
- Bilocular.** Two-celled.
- Bisexual.** Having both stamens and pistils.
- Bivalvular.** With two valves.
- Blade.** The expanded portion of a leaf, etc.
- Bract.** A more or less modified leaf subtending a flower or belonging to an inflorescence.
- Bractlet.** A secondary bract, as one upon the pedicel of a flower.
- Bud.** The rudimentary state of a stem or branch; an unexpanded flower.
- Bulb.** A subterranean leaf-bud with fleshy scales or coats.
- Caducous.** Falling off very early.
- Calyx.** The outer perianth of the flower.
- Cambium.** Layer of cells between the cortex and the wood.
- Campanulate.** Bell-shaped; cup-shaped with a broad base.
- Campylotropous** (ovule or seed). So curved as to bring the apex and base nearly together.
- Canescent.** Hoary with gray pubescence.

Capillary. Hair-like.
Capsular. Belonging to or of the nature of a capsule.
Capsule. A dry dehiscent fruit composed of more than one carpel.
Carpel. A simple pistil, or one member of a compound pistil.
Carpophore. The slender prolongation of the floral axis which in the Umbelliferae supports the pendulous ripe carpels.
Caryopsis. A grain, as of Grasses; a seed-like fruit with a thin pericarp adnate to the contained seed.
Catkin. An ament.
Caudate. Having a slender tail-like appendage.
Cell. One of the minute vesicles, of very various forms, of which plants are formed; any structure containing a cavity, as the cells of anther, ovary, etc.
Cellular (tissue). Composed of short transparent thin-walled cells, in distinction from fibrous or vascular.
Channeled. Deeply grooved longitudinally, like a gutter.
Chlorophyl. The green coloring-matter within the cells of plants.
Circline. Coiled from the top downward, as the young frond of a fern.
Coccus (pl. Cocco). One of the parts into which a lobed fruit with one-seeded cells splits.
Cohesion. The union of one organ with another of like nature.
Commis sure. The surface by which one carpel joins another, as in the Umbelliferae.
Compound. Composed of 2 or more similar parts united into one whole.
 Compound leaf, one divided into separate leaflets.
Compressed. Flattened, especially laterally.
Coniferous. Cone-bearing.
Convolute. Rolled up longitudinally.
Cordate. Heart-shaped with the point upward.
Coriaceous. Leathery in texture.
Corm. The enlarged fleshy base of a stem, bulb-like but solid.
Corolla. The inner perianth, of distinct or connate petals.
Corrugate. Wrinkled or in folds.
Cortex. Bark of the root or stem.
Corymb. A flat-topped or convex open flower-cluster, in the stricter use of the word equivalent to a contracted raceme progressing in its flowering from the margin inward.
Cotyledons. The foliar portion or first leaves (one, two, or more) of the embryo as found in the seed.
Cotyliform. In the shape of a saucer or cup, hemispherical or more shallow.
Crenate. Having rounded teeth on the leaf margin.
Cruciate. Cross-shaped.
Crustaceous. Of hard and brittle texture.
Culm. The peculiar stem of Sedges and Grasses.
Cuneate. Wedge-shaped; triangular with the acute angle downward.
Cuspidate. See *Mucronate*.
Cyme. A usually broad and flattish determinate inflorescence, i.e., with its central or terminal flowers blooming earliest.
Deciduous. Not persistent; not evergreen.
Definite. Of a constant number, not exceeding twenty.
Dehiscent. Opening regularly by valves, slits, etc., as a capsule or anther.
Deltoid. Shaped like the Greek letter Δ.
Dentate. Toothed, usually with the teeth directed outward.
Depressed. Somewhat flattened from above.
Diadelphous (stamens). Combined in two sets.
Diandrous. Having two stamens.
Dicotyledonous. Having two cotyledons.
Digitate. Compound, with the members arising together at the apex of the support.
Dimorphous. Occurring in two forms.
Diocious. Unisexual, with the two kinds of flowers on separate plants.
Discoid. Resembling a disk. Discoid head; in Compositae, one without ray-flowers.
Disk. A development of the receptacle at or around the base of the pistil. In Compositae, the tubular flowers of the head as distinct from the ray.
Dorsal. Upon or relating to the back or outer surface of an organ.

Drupe. A fleshy or pulpy fruit with the inner portion of the pericarp (one-celled and one-seeded, or sometimes several-celled) hard or stony.

Emarginate. Having a shallow notch at the extremity.

Embryo. The rudimentary plantlet within the seed.

Endocarp. The inner layer of a pericarp.

Endodermis. Innermost layer of cells of the cortex.

Endogenous. Growing throughout the substance of the stem, instead of by superficial layers.

Entire. Without toothing or division.

Epicarp. The outer layer of the pericarp or matured ovary.

Epidermis. The superficial layer of cells.

Epiphyte. A plant growing attached to another plant, but not parasitic; an air-plant.

Exfoliating. Cleaving off in thin layers.

Exogenous. Growing by annular layers near the surface; belonging to the Exogens.

Exserted. Projecting beyond an envelope, as stamens from a corolla.

Farinaceous. Containing starch; starch-like.

Fascicle. A close bundle or cluster.

Fastigate (branches). Erect and near together.

Fertile. Capable of producing fruit; or productive, as a flower having a pistil, or an anther with pollen.

Fibrous. Composed of or resembling fibers. **Fibrous Tissue,** a tissue formed of elongated thick-walled cells.

Fibro-vascular. Composed of woody fibers and ducts.

Filament. The part of a stamen which supports the anther; any thread-like body.

Filiform. Thread-shaped; long, slender and terete.

Flaccid. Without rigidity; lax and weak.

Floret. A small flower, usually one of a dense cluster.

Foliaceous. Leaf-like in texture or appearance.

Follicle. A fruit consisting of a single carpel, dehiscing by the ventral suture.

Free. Not adnate to other organs.

Fruit. The seed-bearing product of a plant, simple, compound, or aggregated, of whatever form.

Fugacious. Falling or fading very early.

Fusiform. Spindle-shaped; swollen in the middle and narrowing toward each end.

Galeate. Helmet-shaped; having a galea.

Gamopetalous. Having the petals of the corolla more or less united.

Gamosepalous. Having the sepals united.

Gibbous. Protuberant or swollen on one side.

Glabrous. Smooth; not rough, pubescent, or hairy.

Gland. A secreting surface or structure; any protuberance or appendage having the appearance of such an organ.

Glaucous. Covered or whitened with a bloom.

Gymnospermous. Bearing naked seeds, without an ovary.

Gynæcium. Aggregate of pistils in a flower.

Gynandrous. Having the stamens borne upon the pistil, 'as in Orchidaceæ.

Hastate. Like an arrow-head, but with the basal lobes pointing outward nearly at right angles.

Head. A dense cluster of sessile or nearly sessile flowers on a very short axis or receptacle.

Herb. A plant with no persistent woody stem above ground.

Hilum. The scar or point of attachment of the seed.

Hirsute. Pubescent with rather coarse or stiff hairs.

Hispid. Beset with rigid or bristly hairs or with bristles.

Hairy. Grayish-white with a fine close pubescence.

Hybrid. A cross-breed of two species.

Hypogynous. Situated on the receptacle beneath the ovary and free from the calyx; having the petals and stamens so situated.

Imbricate. Overlapping, either vertically or spirally, where the lower piece covers the base of the next higher, or laterally, as in the aestivation of a calyx or corolla, where at least one piece must be wholly external and one internal.

Impressed. Bent inward, hollowed or furrowed as if by pressure.

Incised. Cut sharply and irregularly, more or less deeply.

Indehiscent. Not opening by valves, etc.; remaining persistently closed.

Indigenous. Native and original to the region.

Inferior. Lower or below; outer or anterior. **Inferior Ovary**, one that is adnate to the calyx.

Inflorescence. The flowering part of a plant, and especially the mode of its arrangement.

Inserted. Attached to or growing out of.

Internode. The portion of a stem between two nodes.

Introrse. Turned inward or toward the axis.

Involute. A circle or collection of bracts surrounding a flower cluster or head, or a single flower.

Involute. Rolled inward.

Keel. A central dorsal ridge, like the keel of a boat; the two anterior united petals of a papilionaceous flower.

Labiate. Lipped; belonging to the Labiatae.

Laciniate. Slashed; cut into narrow pointed lobes.

Lamella. A thin flat plate or laterally flattened ridge.

Lanceolate. Shaped like a lance-head, several times longer than wide, broadest above the base and narrowed to the apex.

Latic. Milk; milky juice.

Leaflet. A single division of a compound leaf.

Legume. The fruit of the Leguminosae, formed of a simple pistil and usually dehiscent by both sutures.

Lenticels. Fissures in the cortex which permit easy access of air to the cells beneath.

Lenticular. Lentic-shaped; of the shape of a double-convex lens.

Ligule. A strap-shaped corolla, as in the ray-flowers of Compositae; a thin scarious projection from the summit of the sheath in Grasses.

Limb. The expanded portion of a gamopetalous corolla above the throat; the expanded portion of any petal or a leaf.

Lip. Each of the upper and lower divisions of a bilabiate corolla or calyx; the peculiar upper (but by a twist of the pedicel apparently lower) petal in Orchids.

Lobe. Any segment of an organ, especially if rounded.

Loculicidal. Dehiscent into the cavity of a cell through the dorsal suture.

Membranaceous, Membranous. Thin, rather soft, and more or less translucent.

Mericarp. One of the achene-like carpels of Umbelliferae.

Micropyle. The point upon the seed at which was the orifice of the ovule.

Microspore. The smaller kind of spore in Selaginellaceae, etc.

Midrib. The central or main rib of a leaf.

Monadelphous (stamens). United by their filaments into a tube or column.

Monocotyledonous. Having but one cotyledon.

Mucronate. Having the apex of the leaf like a continuation of the midrib.

Nerve. A simple or unbranched vein or slender rib.

Node. The place upon a stem which normally bears a leaf or whorl of leaves.

Nucleus. The germ-cell of the ovule, which by fertilization becomes the seed; the kernel of a seed.

Nut. A hard indehiscent 1-seeded and 1-seeded fruit, though usually resulting from a compound ovary.

Obcordate. Inverted heart-shaped.

Oblanceolate. Lanceolate with the broadest part toward the apex.

Obovoid. Having the form of an inverted egg.

Opaque. Dull; neither shining nor translucent.

Ovary. The part of the pistil that contains the ovules.

Ovate. Egg-shaped; having an outline like that of an egg, with the broader end downward.

Ovule. The body which after fertilization becomes the seed.

Palmate (leaf). Radiately lobed or divided.

Panicle. A loose irregularly compound inflorescence with pedicellate flowers.

Papilionaceous (corolla). Having a standard, wings, and keel, as in the peculiar corolla of many Leguminosae.

Pappus. The modified calyx-limb in Compositæ, forming a crown of very various character at the summit of the achene.

Parenchyma. Soft tissue of cells with unthickened walls.

Parietal. Borne on or pertaining to the wall or inner surface of a capsule.

Pedicel. The support of a single flower.

Peduncle. A primary flower-stalk, supporting either a cluster or a solitary flower.

Peltate. Shield-shaped and attached to the support by the lower surface.

Perennial. Lasting year after year.

Perfect (flower). Having both pistil and stamens.

Perianth. The floral envelope, consisting of the calyx and corolla (when present), whatever their form.

Pericarp. The matured ovary.

Periderm. Outer layer of the bark or cortex.

Petal. A division of the corolla.

Petiole. The footstalk of a leaf.

Phænogamous. Having flowers with stamens and pistils and producing seeds.

Phloem. Cell layers between the cambium and cortex.

Pilose. Hairy, especially with soft hairs.

Pinnate (leaf). Compound, with the leaflets arranged on each side of a common petiole.

Pistil. The seed-bearing organ of the flower, consisting of the ovary, stigma, and style when present.

Placenta. Any part of the interior of the ovary which bears ovules.

Plumose. Having fine hairs on each side, like the plume of a feather, as the pappus-bristles of some Thistles.

Plumule. The bud or growing point of the embryo.

Pod. Any dry and dehiscent fruit.

Pollen. The fecundating grains contained in the anther.

Pome. A kind of fleshy fruit of which the apple is the type.

Pubescent. Covered with hairs, especially if short, soft and down-like.

Punctate. Dotted with depressions or with translucent internal glands or colored dots.

Pungent. Terminating in a rigid sharp point; acrid.

Putamen. The shell of a nut; the bony part of a stone-fruit.

Raceme. A simple inflorescence of pediceled flowers upon a common more or less elongated axis.

Radiate. Spreading from or arranged around a common center; bearing ray-flowers.

Radicle. The portion of the embryo below the cotyledons, more properly called the caudicle.

Ray. The branch of an umbel; the marginal flowers of an inflorescence when distinct from the disk.

Receptacle. The more or less expanded portion of an axis which bears the organs of a flower (the torus) or the collected flowers of a head; any similar structure in Cryptogams.

Reniform. Kidney-shaped: applied to leaves.

Reticulate. In the form of network; net-veined.

Retrorse. Directed back or downward.

Revolute. Having both leaf margins inrolled lengthwise.

Rhachis. The axis of a spike or of a compound leaf.

Rhaphe. The ridge or adnate funicle which in an anatropous ovule connects the two ends.

Rhizome. Any prostrate or subterranean stem, usually rooting at the nodes and becoming erect at the apex.

Root. The underground part of a plant which supplies it with nourishment.

Rootstock. Same as *Rhizome*.

Sagittate. Shaped like an arrow-head, the basal lobes directed downward.

Samara. An indehiscent winged fruit.

Scabrous. Rough to the touch.

Scape. A peduncle rising from the ground, naked or without proper foliage.

Sclerenchymatous. Of sclerenchyma, that is, of tissue composed of cells with thickened and hardened walls.

Seed. The ripened ovule, consisting of the embryo and its proper coats.

Sepal. A division of a calyx.
Septicidal (capsule). Dehiscing through the partitions and between the cells.
Serrate. Having sharp teeth pointing forward.
Sessile. Without footstalk of any kind.
Shrub. A woody perennial, smaller than a tree, usually with several stems.
Siliqua. The peculiar pod of Cruciferae.
Spatulate. Gradually narrowed downward from a rounded summit.
Spike. A form of simple inflorescence with the flowers sessile or nearly so upon a more or less elongated common axis.
Spine. A sharp woody or rigid outgrowth from the stem.
Spore. The reproductive organ in Cryptogams, which in function corresponds to a seed but possesses no embryo.
Spur. A hollow sac-like or tubular extension of some part of a blossom, usually nectariferous.
Stamen. One of the pollen-bearing organs of the flower.
Stele. Central cylinder (within the bark) of woody fiber.
Stellar, Stelliform. Star-shaped.
Stem. The main ascending axis of a plant.
Sterile. Unproductive, as a flower without pistil, or a stamen without an anther.
Stigma. That part of a pistil through which fertilization by the pollen is effected.
Stipe. The stalk-like support of a pistil; the leaf-stalk of a fern.
Stipule. An appendage at the base of a petiole or on each side of its insertion.
Stoma (pl. *Stomata*). An orifice in the epidermis of a leaf communicating with internal air cavities.
Strigose. Beset with appressed sharp straight and stiff hairs.
Strobile. An inflorescence marked by imbricated bracts or scales, as in the Hop and Pine Cone.
Style. The usually attenuated portion of the pistil connecting the stigma and ovary.
Symmetrical (flower). Regular as to the number of its parts; having the same number of parts in each circle.
Testa. The outer commonly hard and brittle seed-coat.
Tetradynamous. Having four long and two shorter stamens.
Thallus. In Cryptogams, a cellular expansion taking the place of stem and foliage.
Throat. The orifice of a gamopetalous corolla or calyx; the part between the proper tube and the limb.
Torus. The receptacle of a flower.
Truncate. When the end of the leaf appears to be cut off.
Tuber. A thickened and short subterranean branch having numerous buds or eyes.
Tubercle. A small tuber or tuber-like (not necessarily subterranean) body.
Tuberous. Having the character of a tuber; tuber-like in appearance.
Umbel. An inflorescence in which the peduncles or pedicels of a cluster spring from the same point.
Unisexual. Of one sex; either staminate or pistillate only.
Utricle. A small bladder 1-seeded fruit; any small bladder-like body.
Valve. One of the pieces into which a capsule splits.
Veins. Threads of fibro-vascular tissue in a leaf or other organ, especially those which branch (as distinguished from nerves).
Ventral. Belonging to the anterior or inner face of an organ: the opposite of dorsal.
Vermiform. Worm-shaped.
Vernation. The arrangement of leaves in the bud.
Verticil. A whorl.
Verticillate. Disposed in a whorl.
Vesicle. A small bladder or air-cavity.
Villous. Bearing long and soft hairs.
Viscid. Glutinous; sticky.
Whorl. An arrangement of leaves, etc., in a circle round the stem.
Woolly. Clothed with long and tortuous or matted hairs.

TABLE SHOWING THE LIMIT OF FOREIGN MATTER AND OF ASH SET BY THE U.S.P. OR N.F.; ALSO THE ASSAYS

Compiled for the convenient use of examiners and analysts of drugs. Where no statements are made, the official standards do not give any data.

ABSINTHIUM.—Foreign matter 5 per cent.; ash 10 per cent.

ACACIA.—Ash 4 per cent.; 15 per cent. moisture in powder.

ACONITUM.—Foreign matter 5 per cent.; ash 6 per cent.; assay 0.5 per cent. ether-soluble alkaloids. Biological assay recommended.

ADONIS.—Foreign matter 5 per cent.; ash 12 per cent.

AGARICUS.—Foreign matter 10 per cent.; ash 2 per cent.
White yields to boiling alcohol not less than 50 per cent. resinous extract.

ALETRIS.—Ash 16 per cent.

ALOE.—Ash 4 per cent.; moisture 10 per cent. Of Socotrine aloes not less than 50 per cent. is soluble in cold water; of Curaçao and Cape aloes not less than 60 per cent. is water-soluble.

ALTHÆA.—Ash 8 per cent.

ALTHÆÆ FOLIA.—Foreign matter 5 per cent.; ash 16 per cent.

AMYGDALA DULCIS.—Ash 4 per cent.

ANGELICÆ FRUCTUS.—Foreign matter 3 per cent.; ash 8 per cent.

ANGELICÆ RADIX.—Foreign matter 5 per cent.; ash 8 per cent.

ANISUM.—Foreign matter 3 per cent.; ash 9 per cent.

APII FRUCTUS.—Foreign matter 10 per cent.; ash 8 per cent.

APOCYNUM.—Foreign matter 5 per cent.; ash 5 per cent.

ARALIA.—Foreign matter 5 per cent.; ash 10 per cent.

ASAFÆTIDA.—Ash 15 per cent.; ash from powder 30 per cent.; assay yields not less than 60 per cent. alcohol-soluble constituents, the powder yielding 50 per cent.

- ASARUM.**—Foreign matter 5 per cent.; ash 12 per cent.
- ASCLEPIAS.**—Foreign matter 5 per cent.; ash 9 per cent.
- ASPIDIUM.**—Ash 3 per cent.
- ASPIDOSPERMA.**—Foreign matter 2 per cent.
- AURANTII AMARI CORTEX.**—Ash 7 per cent.
- BALSAMUM PERUVIANUM.**—Acid number 56 to 84; saponification value 235 to 238; assay 56 to 58 per cent. cinnamein.
- BALSAMUM TOLUTANUM.**—Acid number 112 to 168; saponification value 154 to 220.
- BAPTISIA.**—Foreign matter 10 per cent.; ash 5 per cent.
- BELLADONNÆ FOLIA.**—Foreign matter 10 per cent.; ash 20 per cent.; assay 0.3 per cent. alkaloids.
- BELLADONNÆ RADIX.**—Foreign matter 10 per cent.; ash 7 per cent.; assay 0.45 per cent. alkaloids.
- BENZOINUM.**—Ash, Sumatra, 2.5 per cent.; Siam, 2 per cent.; assay 75 per cent. of Sumatra benzoïn dissolves in alcohol and 90 per cent. of Siam benzoïn is alcohol-soluble.
- BERBERIS.**—Foreign matter 5 per cent.; berberis without bark should be rejected; ash 5 per cent.
- BOLDO.**—Foreign matter 2 per cent.; ash 10 per cent.
- BRAYERA.**—Foreign matter 10 per cent.; ash 9 per cent.
- BRYONIA.**—Foreign matter 5 per cent.; ash 8 per cent.
- BUCHU.**—Foreign matter 10 per cent.; ash 4 per cent.
- CACAO PRÆPARATUM.**—Assay yields 14 to 22 per cent. extractive to cold water, not less than 18 per cent. fat to ether, and the fatty residue has no spicy odor or taste; crude fiber 6 per cent.; starch 12 per cent.; ash 3.5 to 8 per cent., reddish.
- CALENDULA.**—Foreign matter 2 per cent.; ash 11 per cent.
- CALUMBA.**—Ash 8 per cent.
- CAMBOGIA.**—Ash 2 per cent.; assay 65 per cent. soluble in alcohol.
- CAMPHORA.**—Ash 0.05 per cent.; dextrorotatory.
- CANELLA.**—Ash 7 per cent.
- CANNABIS.**—Ash 15 per cent.; assay 8 per cent.; bright green alcohol extractive. Biologically assayed on dogs.
- CANTHARIS.**—Ash 9 per cent.; assay 0.6 per cent. cantharidin; 10 per cent. moisture. Cantharides with ammoniacal odor must not be used.

- CAPSICUM.**—Foreign matter 2 per cent.; ash 7 per cent., the amount insoluble in hydrochloric acid not exceeding 1 per cent. of weight of capsicum taken; assay 15 per cent. non-volatile ether-soluble extractive.
- CARBO LIGNI.**—Ash 7.5 per cent.
- CARDAMOMI SEMEN.**—Ash 8 per cent.
- CARUM.**—Foreign matter 3 per cent.; ash 8 per cent.
- CARYOPHYLLUS.**—Foreign matter 5 per cent.; ash 8 per cent., the amount of which insoluble in hydrochloric acid does not exceed 0.5 per cent. weight of clove taken; assay 10 per cent. volatile extractive soluble in ether.
- CASCABILLA.**—Foreign matter 5 per cent.; ash 10 per cent.
- CASTANEA.**—Foreign matter 5 per cent.; ash 5 per cent.
- CATARIA.**—Ash 16 per cent.
- CAULOPHYLLUM.**—Ash 6 per cent.
- CENTAURIUM.**—Ash 5 per cent.
- CERA ALBA.**—Ester value 72 to 79.
- CERA FLAVA.**—Ester value 72 to 77.
- CHIMAPHILA.**—Foreign matter 5 per cent.; ash 7 per cent.
- CHIONANTHUS.**—Foreign matter 8 per cent.; ash 5 per cent.
- CHIRATA.**—Ash 6 per cent.
- CIMICIFUGA.**—Foreign matter 2 per cent.; ash 10 per cent.
- CINCHONA.**—Assay 5 per cent. alkaloids.
- CINCHONA RUBRA.**—Assay 5 per cent. alkaloids.
- CINNAMOMUM SAIGONICUM.**—Assay 2 per cent. volatile extractive soluble in ether; ash 6 per cent., amount insoluble in diluted hydrochloric acid not exceeding 2 per cent. of weight of drug taken.
- CINNAMOMUM ZEYLANICUM.**—Ash 6 per cent., amount insoluble in diluted hydrochloric acid not exceeding 2 per cent. of weight of drug taken; assay 0.5 per cent. volatile extractive soluble in ether.
- COCCULUS INDICUS.**—Ash 5 per cent.
- COCCUS.**—Ash 6 per cent.
- COCILLANA.**—Ash 10 per cent.
- COFFEA TOSTA.**—Ash 3 to 5 per cent.; assay 1 per cent. caffeine, 10 per cent. fat.
- COLCHICI CORMUS.**—Ash 6 per cent.; assay 0.35 per cent. colchicine.
- COLCHICI SEMEN.**—Ash 8 per cent.; assay 0.45 per cent. colchicine.

COLOCYNTHIS.—Foreign matter 5 per cent. seeds, 2 per cent. epicarp; ash 15 per cent.; assay 2 per cent. fixed oil on extraction with purified petroleum benzin.

CONDURANGO.—Ash 12 per cent.

CONIUM.—Ash 8 per cent.; assay 0.5 per cent. coniine.

CONVALLARIÆ FLORES.—Foreign matter 5 per cent.; ash 12 per cent.

CONVALLARIÆ RADIX.—Ash 10 per cent.

COPAIBA.—Resin 36 per cent.; acid value 28 to 95.

COPTIS.—Ash 8 per cent.

CORIANDEUM.—Foreign matter 5 per cent.; ash 7 per cent.; assay 0.5 per cent. volatile extractive soluble in ether.

CORNUS.—Ash 10 per cent.

CORYDALIS.—Foreign matter 5 per cent.; ash 8 per cent.

CROCUS.—Foreign matter 10 per cent.; ash 7.5 per cent. infusible; moisture 14 per cent.

CUBEBA.—Foreign matter 5 per cent.; ash 8 per cent.; assay 10 per cent. volatile extractive soluble in ether.

CYPRIPEDIUM.—Foreign matter 5 per cent.; ash 12 per cent.

DAMIANA.—Foreign matter 10 per cent.; ash 10 per cent.

DELPHINIUM.—Foreign matter 5 per cent.; ash 5 per cent.

DIASTASUM.—Assay; converts 50 parts potato starch into sugar.

DIGITALIS.—Foreign matter 2 per cent.; ash 15 per cent.; biological assay recommended.

DIOSCOREA.—Ash 7 per cent.

DROSER A.—Ash 30 per cent.

DULCAMARA.—Ash 6 per cent.

ECHINACEA.—Ash 6 per cent.

ERGOTA.—Foreign matter 5 per cent.; ash 5 per cent.

ERIODICTYON.—Foreign matter 5 per cent.

EUCALYPTUS.—Foreign matter 3 per cent.

EUONYMUS.—Foreign matter 3 per cent.; ash 12 per cent.

EUPATORIUM.—Ash 10 per cent.

EUPHORBIA PILULIFERA.—Ash 12 per cent.

FARFARA.—Foreign matter 5 per cent.; ash 20 per cent.

FENICULUM.—Foreign matter 4 per cent.; ash 9 per cent.

FRANGULA.—Ash 6 per cent.

FRAXINUS.—Ash 10 per cent.

FUCUS.—Ash 20 per cent.
GALANGA.—Ash 10 per cent.
GALEGA.—Ash 20 per cent.
GALLA.—Not more than 5 per cent. floats in water.
GAMBIE.—Ash 9 per cent.; assay 65 per cent. soluble in water, 60 per cent. alcohol-soluble.
GELATINUM.—Ash 2 per cent.
GENTIANA.—Ash 6 per cent.
GERANIUM.—Ash 8 per cent.
GLYCYRRHIZA.—Ash 7 per cent.
GOSSYPII CORTEX.—Foreign matter 5 per cent.; ash 7 per cent.
GOSSYPIUM PURIFICATUM.—Ash 0.2 per cent.
GRINDELIA.—Foreign matter 10 per cent.
GUAIACI LIGNUM.—Ash 3 per cent.; assay 15 per cent. extractive to alcohol.
GUAIACUM.—Ash 4 per cent.
GUARANA.—Assay 4 per cent. caffeine.
GUTTA PERCHA.—Ash 5 per cent.; 90 per cent. soluble in chloroform, carbon disulphide, petroleum benzin or oil turpentine.
HÆMATOXYLON.—Ash 3.5 per cent.
HAMAMELIDIS FOLIA.—Foreign matter 10 per cent.; ash 6 per cent.
HELONIAS.—Ash 5 per cent.
HUMULUS.—Foreign matter 2 per cent.; ash 8 per cent.
HYDRANGEA.—Ash 3 per cent.
HYDEASTIS.—Foreign matter 2 per cent.; assay 2.5 per cent. ether-soluble alkaloids.
HYOSCYAMUS.—Ash 30 per cent.; assay 0.065 per cent. alkaloids.
IGNATIA.—Ash 4 per cent.; assay 2 per cent. alkaloids.
INULA.—Foreign matter 5 per cent.; ash 10 per cent.
IPECACUANHA.—Foreign matter 5 per cent.; ash 1.8 to 4.5 per cent.; assay 1.75 per cent. ether-soluble alkaloids.
IRIS.—Ash 2 to 5 per cent.
IRIS VESICOLOR.—Foreign matter 5 per cent.; ash 7 per cent.
JALAPA.—Ash 6.5 per cent.; assay 7 per cent. total resins.
JUGLANS.—Ash 8 per cent.

JUNIPERUS.—Ash 5 per cent.; reject old or insect-infected fruit.

KAVA.—Ash 8 per cent.

KINO.—Ash 3 per cent.; moisture 12 per cent.; assay 40 per cent. soluble in boiling water, 45 per cent. alcohol extractive.

KOLA.—Ash 3 per cent.; assay 1.5 per cent. caffeine.

KRAMERIA.—Foreign matter 5 per cent.; ash 5 per cent.; assay 9 per cent. aqueous extractive.

LACTUCARIUM.—Ash 10 per cent.; moisture 15 per cent.

LAPPA.—Ash 6 per cent.

LEPTANDRA.—Foreign matter 5 per cent.; ash 12 per cent.

LINUM.—Foreign matter 3 per cent.; ash 6 per cent.; assay petroleum benzin extracts 30 per cent. fixed oil, 98 per cent. saponifiable.

LOBELIA.—Foreign matter 10 per cent.; ash 8 per cent.

LUPULIN.—Ash 16 per cent.; assay 60 per cent. soluble in ether.

LYCOPODIUM.—Foreign matter 2 per cent.; ash 3 per cent.

MACIS.—Ash 3 per cent.; almost completely soluble in hydrochloric acid; assay 8 per cent. volatile ether extract, 20 to 30 per cent. non-volatile ether extract.

MALTUM.—Assay converts 5 times its weight of starch into sugar.

MALVÆ FOLIA.—Ash 16 per cent.

MANNA.—Acid number not less than 65; soluble completely in ether, almost entirely in alcohol.

MATICO.—Foreign matter 5 per cent.; ash 18 per cent.

MEL.—Ash 0.3 per cent.

MELILOTUS.—Ash 10 per cent.

MENYANTHES.—Ash 10 per cent.

MOSCHUS.—Ash 8 per cent.; moisture 15 per cent.; 50 per cent. soluble in water, 10 per cent. alcohol-soluble.

MYRICA.—Foreign matter 5 per cent.; ash 6 per cent.

MYRISTICA.—Ash 5 per cent.; reject broken or wormy kernels.

MYRRHA.—Ash 8.5 per cent.; 5 per cent. soluble in alcohol.

NUX VOMICA.—Ash 3.5 per cent.; assay 2.5 per cent. alkaloids.

OPIUM.—Assay in normal moist condition, 9.5 per cent. anhydrous morphine.

OPIUM DEODORATUM, OPIUM GRANULATUM and **OPII PULVIS**.—Assay 10 to 10.5 per cent. anhydrous morphine.

PANCREATINUM.—Assay; converts 25 parts starch into soluble carbohydrates.

PAPAVERIS FRUCTUS.—Ash 10 per cent.; remove and reject the seeds before using pharmaceutically.

PARACOTO.—Ash 3 per cent.

PAREIRA.—Foreign matter 5 per cent.; ash 5 per cent.

PASSIFLORA.—Ash 12 per cent.

PEPO.—Foreign matter 5 per cent.

PEPSINUM.—Assay; digests 3000 parts freshly coagulated and disintegrated egg albumin.

PERSIO.—Ash 35 per cent., mainly sodium chloride.

PETROLATUM.—Ash 0.05 per cent.

PETROLATUM LIQUIDUM.—Light, viscosity not more than 3; heavy, viscosity not less than 3.1.

PETROSELINI RADIX.—Ash 6 per cent.

PETROSELINUM.—Foreign matter 5 per cent.

PHYSOSTIGMA.—Ash 3 per cent.; assay 0.15 per cent. alkaloids.

PHYTOLACCA.—Ash 14 per cent.

PILOCARPUS.—Foreign matter 5 per cent.; ash 7 per cent.; assay 0.6 per cent. alkaloids.

PIMENTA.—Foreign matter 5 per cent.; crude fiber 25 per cent.; ash 6 per cent.

PIMPINELLA.—Ash 5 per cent.

PINUS ALBA.—Ash 3 per cent.

PIPER.—Foreign matter 2 per cent.; ash 7 per cent., of which the amount insoluble in diluted hydrochloric acid does not exceed 2 per cent. of weight of pepper taken; assay 6 per cent. non-volatile extract soluble in ether; 25 per cent. starch.

PIX LITHANTHRACIS.—Ash 2 per cent.

PODOPHYLLUM.—Ash 3 per cent.; assay 3 per cent. resin.

PULSATILLA.—Foreign matter 5 per cent.; ash 10 per cent.

PYRETHREUM.—Ash 5 per cent.

QUERCUS.—Ash 7 per cent.

QUILLAJA.—Ash 10 per cent.

RENNINUM.—Assay; coagulates 25,000 parts fresh milk.

RESINA.—Ash 0.05 per cent.; acid number 150.

RHAMNUS CATHARTICA.—Foreign matter 5 per cent.; ash 5 per cent.

RHEUM.—Ash 13 per cent.; assay 30 per cent. dry extract when exhausted with diluted alcohol.

RHUS GLABRA.—Foreign matter 5 per cent.; ash 4 per cent.

ROSA GALLICA.—Ash 3.5 per cent.

RUBUS.—Ash 5 per cent.

RUMEX.—Foreign matter 5 per cent.; ash 10 per cent.

SACCHARUM.—Ash 0.05 per cent.

SACCHARUM LACTIS.—Ash 0.1 per cent.

SAMBUCUS.—Ash 8 per cent.

SANTALUM ALBUM.—Ash 8 per cent.

SANTALUM RUBRUM.—Ash 3 per cent.

SARSAPARILLA.—Ash 10 per cent.

SASSAFRAS.—Foreign matter 2 per cent.; ash 30 per cent.

SCAMMONIÆ RADIX.—Assay 8 per cent. resins.

SCILLA.—Ash 9 per cent.; assayed biologically.

SCOPARIUS.—Ash 5 per cent.

SCUTELLARIA.—Ash 12 per cent.

SENECIO.—Ash 10 per cent.

SENEGA.—Foreign matter 5 per cent.; ash 5 per cent.

SENNA.—Foreign matter 10 per cent.; ash 12 per cent., of which the amount insoluble in hydrochloric acid does not exceed 3 per cent. of drug taken.

SERPENTARIA.—Foreign matter 10 per cent.

SEVUM PRÆPARATUM.—Saponification value 193 to 200; iodine value 33 to 48.

SINAPIS ALBA.—Foreign matter 5 per cent.; ash 9 per cent.

SINAPIS NIGRA.—Foreign matter 5 per cent.; ash 9 per cent.

SOLANUM.—Ash 6 per cent.

SPIGELIA.—Foreign matter 10 per cent.; ash 10 per cent.

STAPHISAGRIA.—Foreign matter 2 per cent.

STILLINGIA.—Ash 5 per cent.

STRAMONIUM.—Foreign matter 10 per cent.; ash 20 per cent.; assay 0.25 per cent. alkaloids.

STROPHANTHUS.—Ash 5 per cent.; assayed biologically.

STYRAX.—Ash 1 per cent.; acid value 56 to 85; saponification value 170 to 230.

SUCCUS CITRI.—Assay 5 to 10 Gm. crystal citric acid in 100 mls.

SUPRARENALUM SICCUM.—Ash 7 per cent.; moisture 7 per cent.; assay 0.4 to 0.6 per cent. epinephrine.

TARAXACUM.—Ash 10 per cent.

TEREBINTHINA LARICIS.—Acid number 80.

THUJA.—Foreign matter 1 per cent.; ash 7 per cent.

THYMUS.—Ash 14 per cent.

THYROIDEUM SICCUM.—Assay 0.17 to 0.23 per cent. iodine; moisture 6 per cent.; ash 5 per cent.

TRAGACANTHA.—Ash 3.5 per cent.

TRIFOLIUM.—Ash 10 per cent.

TRILLIUM.—Ash 5 per cent.

TRITICUM.—Ash 3 per cent.

UVA URSL.—Foreign matter 5 per cent.

VALERIANA.—Ash 20 per cent.

VANILLA.—Ash 6 per cent.; assay yields 12 per cent. extractive to diluted alcohol.

VERATRUM VIRIDE.—Foreign matter 5 per cent.

VERBSCI FLORES.—Ash 6 per cent.

VERBSCI FOLIA.—Ash 14 per cent.

VERBENA.—Ash 10 per cent.

VIBURNUM OPULUS.—Foreign matter 5 per cent.

VIBURNUM PRUNIFOLIUM.—Foreign matter 5 per cent.

XANTHOXYLI FRUCTUS.—Ash 7 per cent.

ZEDOARIA.—Ash 7 per cent.

ZINGIBER.—Ash 8 per cent.; assay 2 per cent. non-volatile extract soluble in ether and 4 per cent. alcohol-soluble extract.



Jamaica Dogwood, 500 lbs. New burlap and new $\frac{1}{2}$ -inch rope. Open on the broad sides of the bale. No other drug comes to market in this packing.

DOSES of U. S. P. and N. F. Products

Arranged from Lowest to Highest

ABBREVIATIONS:

Gm. = Gramme(s) mil = milliliter (or Cc.)
gr. = grain(s) min. = minim(s)

EQUIVALENTS:

1 Gm. = 15 grs. 1 mil = 15 min.
0.5 Gm. = 8 grs. 4 mills = 1 fl. dr.

Part I—Liquids

0.008 mil ($\frac{1}{8}$ minim)

Oleum Sinapis Volatile, U.S.P.

0.03 mil ($\frac{1}{2}$ minim)

Benzaldehydum, U.S.P.
Fluidextractum Aconiti, U.S.P.
Fluidextractum Gelsemii, U.S.P.
Oleum Amygdalæ Amaræ, U.S.P.

0.05 mil (1 minim)

Cresol, U.S.P.
Fluidextractum Belladonnæ
Radici, U.S.P.
Fluidextractum Digitalis, U.S.P.
Fluidextractum Ipecacuanhæ,
U.S.P.
Fluidextractum Nucis Vomiceæ,
U.S.P.
Fluidextractum Stramonii, N.F.
Oleum Phosphoratum, N.F.
Oleum Tiglii, U.S.P.
Phenol Liquefactum, U.S.P.
Spiritus Glycerylis Nitratis, U.S.P.

0.1 mil ($\frac{1}{2}$ minims)

Acidum Hydrocyanicum Dilutum,
U.S.P.
Fluidextractum Arnicæ, N.F.
Fluidextractum Cannabis, U.S.P.
Fluidextractum Sanguinarie, N.F.
Fluidextractum Scillæ, U.S.P.
Fluidextractum Veratri Viridis,
U.S.P.
Liquor Arseni et Hydrargyri
Iodidi, U.S.P.
Liquor Ferri Chloridi, U.S.P.
Tinctura Cantharidis, U.S.P.
Tinctura Iodii, U.S.P.

0.125 mil (2 minims)

Fluidextractum Adonidis, U.S.P.

0.15 mil ($2\frac{1}{2}$ minims)

Fluidextractum Lobeliæ, U.S.P.

0.2 mil (3 minims)

Acidum Nitrohydrochloricum,
U.S.P.
Amylis Nitris, U.S.P.
Anethol, N.F.
Bromoformum, U.S.P.
Eugenol, U.S.P.

Fluidextractum Colchici Cormi,
N.F.

Fluidextractum Colchici Seminis,
U.S.P.

Fluidextractum Conii, N.F.
Fluidextractum Hyoscyami, U.S.P.
Liquor Acidi Arsenosi, U.S.P.
Liquor Arsenicalis, Clemens, N.F.
Liquor Auri et Arseni Bromidi,
N.F.

Liquor Ferri Subsulphatis, U.S.P.
Liquor Hydrargyri et Potassii
Iodidi, N.F.

Liquor Iodi Compositus, U.S.P.
Liquor Potassii Arsenitis, U.S.P.
Liquor Sodii Arsenatis, U.S.P.
Oleum Anisi, U.S.P.
Oleum Aurantii, U.S.P.
Oleum Aurantii Amari, N.F.
Oleum Cari, U.S.P.
Oleum Caryophylli, U.S.P.
Oleum Cassiæ, U.S.P.
Oleum Chenopodii, U.S.P.
Oleum Coriandri, U.S.P.
Oleum Fœniculi, U.S.P.
Oleum Juniperi, U.S.P.
Oleum Lavandulæ, U.S.P.
Oleum Limonis, U.S.P.
Oleum Menthæ Piperitæ, U.S.P.
Oleum Menthæ Viridis, U.S.P.
Oleum Myristicæ, U.S.P.
Oleum Picis Liquidæ Rectificatum,
U.S.P.
Oleum Pimentæ, U.S.P.
Oleum Rosmarini, U.S.P.
Oleum Sassafras, U.S.P.
Oleum Thymi, U.S.P.

0.25 mil (4 minims)

Creosotum, U.S.P.
Terebenum, U.S.P.
Tinctura Gelsemii, U.S.P.

0.3 mil (5 minims)

Acidum Formicum, N.F.
Chloroformum, U.S.P.
Eucalyptol, U.S.P.
Fluidextractum Paracoto, N.F.
Glyceritum Phenolis, U.S.P.
Liquor Ferri Acetatis, N.F.
Liquor Ferri Nitratis, N.F.

DOSES—Part I. Liquids—continued

- Mistura Opii et Sassafras, N.F.
 Oleum Terebinthinæ Rectificatum, U.S.P.
 Tinctura Aconiti, U.S.P.
- 0.35 mil (8 minims)**
 Liquor Sodii Glycerophosphatis, U.S.P.
- 0.5 mil (8 minims)**
 Acetum Opii, N.F.
 Acidum Hydriodicum Dilutum, U.S.P.
 Acidum Hypophosphorosum Dilutum, U.S.P.
 Fluidextractum Boldi, N.F.
 Fluidextractum Caulophylli, N.F.
 Fluidextractum Convallariæ Florum, N.F.
 Fluidextractum Convallariæ Radicis, N.F.
 Fluidextractum Euonymi, N.F.
 Fluidextractum Lupulini, N.F.
 Fluidextractum Podophylli, U.S.P.
 Fluidextractum Quassiae, N.F.
 Gualiacol, U.S.P.
 Mistura Carminativa, N.F.
 Oleoresina Petroselinæ, U.S.P.
 Oleum Cajuputi, U.S.P.
 Oleum Cubebe, U.S.P.
 Oleum Eucalypti, U.S.P.
 Oleum Santali, U.S.P.
 Spiritus Amygdalæ Amaræ, U.S.P.
 Tinctura Capsici, U.S.P.
 Tinctura Digitalis, U.S.P.
 Tinctura Ferri Chloridi, U.S.P.
 Tinctura Ferri Citro-Chloridi, N.F.
 Tinctura Ipecacuanhæ et Opii, N.F.
 Tinctura Nucis Vomicae, U.S.P.
 Tinctura Opii, U.S.P.
 Tinctura Opii Deodorati, U.S.P.
 Tinctura Stramonii, U.S.P.
 Tinctura Strophanthi, U.S.P.
 Tinctura Veratri Viridis, U.S.P.
- 0.6 mil (10 minims)**
 Fluidextractum Corydalis, N.F.
 Fluidextractum Fuci, N.F.
 Liquor Ferri Citratis, N.F.
 Liquor Ferri Protochloridi, N.F.
 Liquor Phosphori, N.F.
 Liquor Strychninæ Acetatis, N.F.
 Tinctura Ignatiæ, N.F.
 Tinctura Opii Crocata, N.F.
 Tinctura Passifloræ, N.F.
 Tinctura Pectoralis, N.F.
 Vinum Colchici Cormi, N.F.
- 0.75 mil (12 minims)**
 Fluidextractum Apocyni, N.F.
 Methylis Salicylas, U.S.P.
 Tinctura Belladonnæ Foliorum, U.S.P.
 Tinctura Cannabis, U.S.P.
- 1 mil (15 minims)**
 Acetum Scillæ, U.S.P.
 Acidum Hydrobromicum Dilutum, U.S.P.
- Acidum Hydrochloricum Dilutum, U.S.P.
 Acidum Nitrohydrochloricum Dilutum, U.S.P.
 Acidum Sulphuricum Aromaticum, U.S.P.
 Acidum Sulphuricum Dilutum, U.S.P.
 Ether, U.S.P.
 Ether Aceticus, N.F.
 Aqua Ammoniacæ, U.S.P.
 Copaiba, U.S.P.
 Elixir Anisi, N.F.
 Fluidextractum Aromaticum, U.S.P.
 Fluidextractum Aurantii Amari, U.S.P.
 Fluidextractum Baptisæ, N.F.
 Fluidextractum Cascaræ Sagradæ, U.S.P.
 Fluidextractum Chirata, N.F.
 Fluidextractum Cimicifugæ, U.S.P.
 Fluidextractum Cinchonæ, U.S.P.
 Fluidextractum Cinchonæ Aquosum, N.F.
 Fluidextractum Cocillanæ, N.F.
 Fluidextractum Cubebe, N.F.
 Fluidextractum Cyprædii, N.F.
 Fluidextractum Echinacæ, N.F.
 Fluidextractum Eriodictyli, U.S.P.
 Fluidextractum Frangulæ, U.S.P.
 Fluidextractum Gentianæ, U.S.P.
 Fluidextractum Geranii, N.F.
 Fluidextractum Jalapæ, N.F.
 Fluidextractum Kava, N.F.
 Fluidextractum Krameriæ, N.F.
 Fluidextractum Leptandæ, N.F.
 Fluidextractum Phytolacæ, N.F.
 Emetic, 1 mil (15 minims); alterative, 0.1 mil (1½ minims)
 Fluidextractum Quercus, N.F.
 Fluidextractum Rhamni Cathartica, N.F.
 Fluidextractum Rhei, U.S.P.
 Fluidextractum Rhois Glabræ, N.F.
 Fluidextractum Rubi, N.F.
 Fluidextractum Sabal, U.S.P.
 Fluidextractum Scoparii, N.F.
 Fluidextractum Scutellaris, N.F.
 Fluidextractum Senegæ, U.S.P.
 Fluidextractum Serpentariæ, N.F.
 Fluidextractum Verbenæ, N.F.
 Fluidextractum Zingiberis, U.S.P.
 Fluidglyceratum Cascaræ Sagradæ, N.F.
 Fluidglyceratum Cascaræ Sagradæ Aromaticum, N.F.
 Fluidglyceratum Krameriæ, N.F.
 Fluidglyceratum Rhei, N.F.
 Liquor Ferri Hypophosphitis, N.F.
 Liquor Hypophysis, U.S.P.
 Liquor Potassii Citratis, U.S.P.
 Liquor Potassii Hydroxidi, U.S.P.
 Spiritus Ammoniac Anisatus, N.F.
 Spiritus Camphoræ, U.S.P.
 Syrupus Ferri et Manganii Iodidi, N.F.
 Syrupus Ferri Iodidi, U.S.P.

DOSES—Part I. Liquids—continued

- Tinctura Arnice, U.S.P.
 Tinctura Asafoetide, U.S.P.
 Tinctura Benzoini, U.S.P.
 Tinctura Cacti Grandiflori, N.F.
 Tinctura Lobelia, U.S.P.
 Tinctura Myrrhæ, U.S.P.
 Tinctura Physostigmatis, U.S.P.
 Tinctura Sanguinaria, U.S.P.
 Tinctura Scillæ, U.S.P.
 Vinum Antimonii, N.F.
 Vinum Ipecacuanhæ, N.F.
- 2 mls (30 minims)**
- Acidum Aceticum Dilutum, U.S.P.
 Acidum Lacticum, U.S.P.
 Acidum Phosphoricum Dilutum, U.S.P.
 Emulsum Olei Terebinthinæ, U.S.P.
 Fluidextractum Aletridis, N.F.
 Fluidextractum Angelicæ Radicis, N.F.
 Fluidextractum Apii Fructus, N.F.
 Fluidextractum Aralix, N.F.
 Fluidextractum Asclepiadis, N.F.
 Fluidextractum Berberidis, N.F.
 Fluidextractum Buchu, U.S.P.
 Fluidextractum Buchu Compositum, N.F.
 Fluidextractum Calumbæ, N.F.
 Fluidextractum Cascaræ Sagradæ Aromaticum, U.S.P.
 Fluidextractum Chimaphille, N.F.
 Fluidextractum Ohionanthi, N.F.
 Fluidextractum Coffeæ, N.F.
 Fluidextractum Coptis, N.F.
 Fluidextractum Corni, N.F.
 Fluidextractum Damianæ, N.F.
 Fluidextractum Ergotæ, U.S.P.
 Fluidextractum Eucalypti, U.S.P.
 Fluidextractum Eupatorii, N.F.
 Fluidextractum Euphorbiæ Pihuliferæ, N.F.
 Fluidextractum Glycyrrhiæ, U.S.P.
 Fluidextractum Gossypii Corticis, N.F.
 Fluidextractum Granati, U.S.P.
 Fluidextractum Grindeliæ, U.S.P.
 Fluidextractum Guarana, U.S.P.
 Fluidextractum Hamamelidis Foliorum, N.F.
 Fluidextractum Heloniatæ, N.F.
 Fluidextractum Humuli, N.F.
 Fluidextractum Hydrangæ, N.F.
 Fluidextractum Hydrastis, U.S.P.
 Fluidextractum Iridis Versicoloris, N.F.
 Fluidextractum Lappæ, N.F.
 Fluidextractum Pareiræ, N.F.
 Fluidextractum Petroselinæ Radicis, N.F.
 Fluidextractum Pilocarpi, U.S.P.
 Fluidextractum Pruni Virginianæ, N.F.
 Fluidextractum Rosæ, U.S.P.
 Fluidextractum Sarsaparillæ, U.S.P.
 Fluidextractum Sarsaparillæ Compositum, U.S.P.
- Fluidextractum Sennæ, U.S.P.
 Fluidextractum Stillingiæ, U.S.P.
 Fluidextractum Stillingiæ Compositum, N.F.
 Fluidextractum Sumbul, U.S.P.
 Fluidextractum Thuje, N.F.
 Fluidextractum Trillii, N.F.
 Fluidextractum Uvæ Ursi, U.S.P.
 Fluidextractum Valerianæ, N.F.
 Fluidextractum Viburni Opuli, N.F.
 Fluidextractum Viburni Prunifolii, U.S.P.
 Fluidextractum Xanthoxyli, U.S.P.
 Fluidglyceratum Glycyrrhiæ, N.F.
 Glyceritum Acidi Tannici, U.S.P.
 Glyceritum Guaiaci, N.F.
 Glyceritum Hydrastis, U.S.P.
 Liquor Ferri Oxyschloridi, N.F.
 Liquor Sodii Arsenatis, Pearson, N.F.
 Mistura Chloroformi et Morphine Composita, N.F.
 Mistura Opii et Chloroformi Composita, N.F.
 Mistura Opii et Rhei Composita, N.F.
 Paraldehydum, U.S.P.
 Spiritus Ætheris Nitrosi, U.S.P.
 Spiritus Ammoniac Aromaticus, U.S.P.
 Spiritus Anisi, U.S.P.
 Spiritus Chloroformi, U.S.P.
 Spiritus Cinnamomi, U.S.P.
 Spiritus Juniperi, U.S.P.
 Spiritus Lavandulæ, U.S.P.
 Spiritus Menthæ Piperitæ, U.S.P.
 Spiritus Menthæ Viridis, U.S.P.
 Syrupus Calcii Iodidi, N.F.
 Syrupus Pini Strobili Compositus cum Morphina, N.F.
 Syrupus Sanguinaria, N.F.
 Syrupus Scillæ, U.S.P.
 Syrupus Scillæ Compositus, U.S.P.
 Tinctura Aloes, U.S.P.
 Tinctura Aloes et Myrrhæ, N.F.
 Tinctura Amara, N.F.
 Tinctura Aromatica, N.F.
 Tinctura Benzoini Composita, U.S.P.
 Tinctura Capsici et Myrrhæ, N.F.
 Tinctura Cardamomi, U.S.P.
 Tinctura Cinnamomi, U.S.P.
 Tinctura Colchici Seminis, U.S.P.
 Tinctura Ferri Chloridi Ætherea, N.F.
 Tinctura Guaiaci Ammoniata, U.S.P.
 Tinctura Hyoscyami, U.S.P.
 Tinctura Lactucarii, U.S.P.
 Tinctura Lavandulæ Composita, U.S.P.
 Tinctura Paracoto, N.F.
 Tinctura Pulsatillæ, N.F.
 Tinctura Quassia, U.S.P.
 Tinctura Rhei Aromatica, U.S.P.
 Tinctura Rhei Dulcis, N.F.
 Tinctura Tolutana, U.S.P.

DOSES—Part I. Liquids—continued

- Tinctura Valerianæ Ammoniatæ, U.S.P.
Tinctura Zingiberis, U.S.P.
Vinum Colchici Seminis, N.F.
- 3 mils (45 minims)**
Glyceritum Pepsini, N.F.
- 4 mils (1 fl. dr.)**
Aqua Amygdalæ Amaræ, U.S.P.
Elixir Ammonii Bromidi, N.F.
Elixir Ammonii Valeratis, N.F.
Elixir Bismuthi, N.F.
Elixir Buchu, N.F.
Elixir Buchu Compositum, N.F.
Elixir Buchu et Potassii Acetatis, N.F.
Elixir Calcii Bromidi, N.F.
Elixir Calcii et Sodii Glycerophosphatum, N.F.
Elixir Cascaræ Sagradæ, N.F.
Elixir Cascaræ Sagradæ Compositum, N.F.
Elixir Cinchonæ Alkaloidorum, Ferri, Bismuthi et Strychninæ, N.F.
Elixir Cinchonæ Alkaloidorum, Ferri et Strychninæ, N.F.
Elixir Corydalis Compositum, N.F.
Elixir Eriodictyi Aromaticum, N.F.
Elixir Ferri Hypophosphitis, N.F.
Elixir Ferri Lactatis, N.F.
Elixir Ferri Phosphatis, N.F.
Elixir Ferri Pyrophosphatis, N.F.
Elixir Ferri Pyrophosphatis, Quininæ et Strychninæ, N.F.
Elixir Ferri, Quininæ et Strychninæ, N.F.
Elixir Gentianæ, N.F.
Elixir Gentianæ et Ferri, N.F.
Elixir Gentianæ et Ferri Phosphatis, N.F.
Elixir Guaranæ, N.F.
Elixir Pepsini, Bismuthi et Strychninæ, N.F.
Elixir Phosphori, N.F.
Elixir Phosphori et Nucis Vomice, N.F.
Elixir Quininæ Valeratis et Strychninæ, N.F.
Elixir Sodii Hypophosphitis, N.F.
Elixir Sodii Salicylatis, N.F.
Elixir Sodii Salicylatis Compositum, N.F.
Elixir Strychninæ Valeratis, N.F.
Elixir Terpini Hydratis, N.F.
Elixir Terpini Hydratis et Codeinæ, N.F.
Elixir Terpini Hydratis et Diacetylmorphinæ, N.F.
Elixir Trium Bromidorum, N.F.
Elixir Viburni Opuli Compositum, N.F.
Elixir Viburni Prunifolii, N.F.
Elixir Zinci Valeratis, N.F.
Fluidextractum Aspidospermatis, U.S.P.
Fluidextractum Castanæ, N.F.
Fluidextractum Catarinæ, N.F.
Fluidextractum Condurango, N.F.
Fluidextractum Dioscoreæ, N.F.
Fluidextractum Droseræ, N.F.
Fluidextractum Dulcamaræ, N.F.
Fluidextractum Galegæ, N.F.
Fluidextractum Helianthemi, N.F.
Fluidextractum Juglandis, N.F.
Fluidextractum Juniperi, N.F.
Fluidextractum Kolæ, N.F.
Fluidextractum Matico, N.F.
Fluidextractum Rumicis, N.F.
Fluidextractum Senecionis, N.F.
Fluidextractum Solani, N.F.
Fluidextractum Spigeliæ, U.S.P.
Fluidextractum Thymi, N.F.
Fluidextractum Trifolii, N.F.
Fluidextractum Verbasci Foliorum, N.F.
Fluidextractum Zææ, N.F.
Glycerinum, U.S.P.
Glyceritum Picis Liquidæ, N.F.
Infusum Digitalis, U.S.P.
Liquor Ammonii Citratis, N.F.
Liquor Antisepticus, N.F.
Liquor Bismuthi, N.F.
Liquor Chlorig Compositus, N.F.
Liquor Hydrastinæ Compositus, N.F.
Liquor Hydrogenii Dioxidii, U.S.P.
Liquor Hypophosphitum, N.F.
Liquor Hypophosphitum Compositus, N.F.
Liquor Pancreatini, N.F.
Liquor Phosphatum Acidus, N.F.
Magma Bismuthi, U.S.P.
Mel Rosæ, U.S.P.
Mistura Chloralis et Potassii Bromidi Composita, N.F.
Mistura Copaibæ et Opii, N.F.
Mistura Pectoralis, Stokes, N.F.
Mistura Rhei Alkalina, N.F.
Mistura Rhei Composita, N.F.
Oxymel Scillæ, N.F.
Spiritus Acidi Formici, N.F.
Spiritus Ætheris, U.S.P.
Spiritus Ætheris Compositus, N.F.
Syrupus Acidi Hydriodici, U.S.P.
Syrupus Allii, N.F.
Syrupus Althææ, N.F.
Syrupus Ammonii Hypophosphitis, N.F.
Syrupus Asari Compositus, N.F.
Syrupus Bromidorum, N.F.
Syrupus Calcii et Sodii Hypophosphitum, N.F.
Syrupus Calcii Hydrochlorophosphatis, N.F.
Syrupus Calcii Hypophosphitis, N.F.
Syrupus Calcii Lactophosphatis et Ferri, N.F.
Syrupus Cimicifugæ Compositus, N.F.
Syrupus Cinnamomi, N.F.
Syrupus Codeinæ, N.F.

DOSES—Part I. Liquids—continued

Syrupus Ferri Hypophosphitis, N.F.	Tinctura Sabal et Santali, N.F.
Syrupus Ferri Lactophosphatis, N.F.	Tinctura Serpentariæ, N.F.
Syrupus Ferri Protochloridi, N.F.	Tinctura Sumbul, N.F.
Syrupus Ferri Quininae et Strychninae Phosphatum, N.F.	Tinctura Valerianæ, N.F.
Syrupus Ferri Saccharati Solubilis, N.F.	Tinctura Viburni Opuli Composita, N.F.
Syrupus Ficorum Compositus, N.F.	Tinctura Zedoariæ Amara, N.F.
Syrupus Iodotannicus, N.F.	Vinum Aurantii Compositum, N.F.
Syrupus Ipecacuanhæ et Opii, N.F.	Vinum Fraxini, N.F.
Syrupus Krameria, N.F.	Vinum Pruni Virginianæ, N.F.
Syrupus Morphinae et Acaciæ, N.F.	Vinum Pruni Virginianæ Ferratum, N.F.
Syrupus Papaveris, N.F.	Vinum Rhei Compositum, N.F.
Syrupus Phosphatum Compositus, N.F.	
Syrupus Phosphatum cum Quinina et Strychnina, N.F.	8 mls (2 fl. drs.)
Syrupus Picis Liquidæ, U.S.P.	Cordiale Rubi Fructus, N.F.
Syrupus Pini Strobi Compositus, N.F.	Elixir Calcii Hypophosphitis, N.F.
Syrupus Pruni Virginianæ, U.S.P.	Elixir Calcii Lactophosphatis, N.F.
Syrupus Quinidina, N.F.	Elixir Cinchonæ Alkaloidorum, N.F.
Syrupus Rubi, N.F.	Elixir Cinchonæ Alkaloidorum et Ferri, N.F.
Syrupus Senegæ, U.S.P.	Elixir Cinchonæ Alkaloidorum et Hypophosphitum, N.F.
Syrupus Sennæ, U.S.P.	Elixir Cinchonæ Alkaloidorum, Ferri et Bismuthi, N.F.
Syrupus Sodii Hypophosphitis, N.F.	Elixir Cinchonæ Alkaloidorum Ferri et Calcii Lactophosphatis, N.F.
Syrupus Stillingiæ Compositus, N.F.	Elixir Cinchonæ Alkaloidorum, Ferri et Pepsini, N.F.
Tinctura Antiperiodica, N.F.	Elixir Formatum, N.F.
Tinctura Antiperiodica sine Aloe, N.F.	Elixir Formatum Compositum, N.F.
Tinctura Aurantii Amari, U.S.P.	Elixir Gentianæ Glycerinatum, N.F.
Tinctura Aurantii Dulcis, U.S.P.	Elixir Glycerophosphatum Compositum, N.F.
Tinctura Bryonia, N.F.	Elixir Glycyrrhizæ Aquosum, N.F.
Tinctura Calumbæ, U.S.P.	Elixir Glycyrrhizæ Aromaticum, N.F.
Tinctura Cardamomi Composita, U.S.P.	Elixir Humuli, N.F.
Tinctura Cimicifugæ, N.F.	Elixir Hypophosphitum, N.F.
Tinctura Cinchonæ, U.S.P.	Elixir Hypophosphitum et Ferri, N.F.
Tinctura Cinchonæ Composita, U.S.P.	Elixir Lithii Bromidi, N.F.
Tinctura Cubebæ, N.F.	Elixir Lithii Citratis, N.F.
Tinctura Ergotæ Ammoniata, N.F.	Elixir Lithii Salicylatis, N.F.
Tinctura Ferri Pomata, N.F.	Elixir Pepsini, N.F.
Tinctura Gallæ, N.F.	Elixir Pepsini et Bismuthi, N.F.
Tinctura Gambir Composita, U.S.P.	Elixir Pepsini et Ferri, N.F.
Tinctura Gentianæ Composita, U.S.P.	Elixir Pepsini et Rennini Compositum, N.F.
Tinctura Guaiaci, U.S.P.	Elixir Potassii Bromidi, N.F.
Tinctura Guaiaci Composita, N.F.	Elixir Sodii Bromidi, N.F.
Tinctura Humuli, N.F.	Elixir Taraxaci Compositum, N.F.
Tinctura Hydrastis, U.S.P.	Emulum Olei Morrhuæ cum Hypophosphitibus, N.F.
Tinctura Jalapæ, N.F.	Liquor Ferri Albuminati, N.F.
Tinctura Jalapæ Composita, N.F.	Liquor Ferri Peptonati, N.F.
Tinctura Kino, U.S.P.	Liquor Ferri Peptonati et Mangani, N.F.
Tinctura Kino et Opii Composita, N.F.	Liquor Ferri Salicylatis, N.F.
Tinctura Krameria, N.F.	Liquor Pepsini, N.F.
Tinctura Moschi, U.S.P.	Liquor Pepsini Aromaticus, N.F.
Tinctura Opii Camphorata, U.S.P.	Liquor Sodæ et Menthæ, N.F.
Tinctura Pimpinellæ, N.F.	Liquor Sodii Citratis, N.F.
Tinctura Rhei, U.S.P.	Liquor Sodii Phosphatis Compositus, N.F.
Tinctura Rhei Aquosa, N.F.	
Tinctura Rhei et Gentianæ, N.F.	

DOSES—Part I. *Liquids—continued*

- Mistura Ammonii Chloridi, N.F.**
Mistura Camphoræ Acida, N.F.
Mistura Camphoræ Aromatica, N.F.
Mistura Copaibæ, N.F.
Mistura Magnesiæ, Asafetidæ et Opii, N.F.
Mistura Olei Picis, N.F.
Succus Citri et Pepsinum, N.F.
Syrupus Eriodictyi Aromaticus, N.F.
Syrupus Glycyrrhizæ, N.F.
Syrupus Hypophosphitum Compositus, N.F.
Syrupus Mannæ, N.F.
Syrupus Rhamni Catharticus, N.F.
Syrupus Sennæ Aromaticus, N.F.
Syrupus Sennæ Compositus, N.F.
Vinum Carnis, N.F.
Vinum Carnis et Ferri, N.F.
Vinum Ferri, N.F.
Vinum Ferri Amarum, N.F.
Vinum Pepsini, N.F.
Vinum Picis, N.F.
- 10 mls (2½ fl. drs.)**
Aqua Camphoræ, U.S.P.
Aqua Creosoti, U.S.P.
Fluidextractum Taraxaci, U.S.P.
Fluidextractum Triticis, U.S.P.
Magma Magnesiæ, U.S.P.
Mistura Glycyrrhizæ Composita, U.S.P.
Oleum Morrhue, U.S.P.
Spiritus Juniperi Compositus, U.S.P.
Syrupus Calcii Lactophosphatis, U.S.P.
Syrupus Hypophosphitum, U.S.P.
Syrupus Lactucarii, U.S.P.
Syrupus Rhei, U.S.P.
Syrupus Rhei Aromaticus, U.S.P.
- 12 mls (3 fl. drs.)**
Elixir Catharticum Compositum, N.F.
- 15 mls (4 fl. drs.)**
Aqua Anisi, U.S.P.
Aqua Chloroformi, U.S.P.
Aqua Cinnamomi, U.S.P.
Aqua Fœniculi, U.S.P.
Aqua Menthæ Piperitæ, U.S.P.
Aqua Menthæ Viridis, U.S.P.
Elixir Potassii Acetatis, N.F.
Elixir Potassii Acetatis et Juniperi, N.F.
Elixir Rubi Compositum, N.F.
Emulsum Asafetidæ, U.S.P.
Emulsum Olei Morrhue, U.S.P.
Emulsum Olei Morrhue cum Calcii Lactophosphate, N.F.
Emulsum Olei Morrhue cum Calcii Phosphate, N.F.
Emulsum Olei Morrhue cum Malto, N.F.
- Emulsum Olei Morrhue cum Pruno Virginiana, N.F.**
Emulsum Olei Morrhue cum Vitello, N.F.
Emulsum Petrolati, N.F.
Infusum Gentianæ Compositum, N.F.
Liquor Ammonii Acetatis, U.S.P.
Liquor Calcis, U.S.P.
Liquor Ferri et Ammonii Acetatis, U.S.P.
Mistura Cretæ, U.S.P.
Mistura Ferri Composita, N.F.
Mistura Guaiaci, N.F.
Mucilago Acaciæ, U.S.P.
Mucilago Sassafras Medullæ, N.F.
Oleum Ricini, U.S.P.
Oleum Ricini Aromaticum, N.F.
Petrolatum Liquidum, U.S.P.
Syrupus Ipecacuanhæ, U.S.P.
Syrupus Sarsaparillæ Compositus, U.S.P.
Syrupus Tolutanus, U.S.P.
Syrupus Zingiberis, U.S.P.
- 30 mls (1 fl. oz.)**
Oleum Lini, U.S.P.
Oleum Olivæ, U.S.P.
- 45 mls (1½ fl. ozs.)**
Emulsum Olei Ricini, N.F.
- 50 mls (12 fl. drs.)**
Infusum Cinchonæ, N.F.
- 60 mls (2 fl. ozs.)**
Infusum Pruni Virginianæ, N.F.
- 100 mls (3 fl. ozs.)**
Infusum Rosæ Compositum, N.F.
- 120 mls (4 fl. ozs.)**
Decoctum Sarsaparillæ Compositum, N.F.
Ferri Hydroxidum cum Magnesi Oxido, U.S.P. (arsenic antidote)
Infusum Sennæ Compositum, U.S.P.
- 250 mls (8 fl. ozs.)**
Infusum Brayeræ, N.F.
Lac Fermentatum, N.F.
- 360 mls (12 fl. ozs.)**
Liquor Magnesii Citratis, U.S.P.
Liquor Magnesii Sulphatis Effervescens, N.F.
- 1 bottle**
Liquor Sodii Citro-Tartratis Effervescens, N.F.

DOSES—Part I. Liquids—concluded. Part II. Solids

Hypoderm.—10000 units

Protective—1000 units

Serum Antidiphthericum, U.S.P.
 Serum Antidiphthericum Purificatum, U.S.P.
 Serum Antidiphthericum Siccum, U.S.P.

Hypoderm.—10000 units

Protective—1500 units

Serum Antitetanicum, U.S.P.
 Serum Antitetanicum Purificatum, U.S.P.
 Serum Antitetanicum Siccum, U.S.P.

Part II—Solids

0.00015 Gm. (0.15 milligramme) 0.005 Gm. ($\frac{1}{12}$ gr.)

($\frac{1}{400}$ gr.)

Aconitina, U.S.P.

0.0003 Gm. ($\frac{1}{200}$ gr.)

Hyoscyaminæ Hydrobromidum, U.S.P.

Scopolaminæ Hydrobromidum, U.S.P.

0.0005 Gm. ($\frac{1}{120}$ gr.)

Atropina, U.S.P.

Atropinæ Sulphas, U.S.P.

Colchicina, U.S.P.

Hemotropinæ Hydrobromidum, U.S.P.

Phosphorus, U.S.P.

0.00075 Gm. ($\frac{1}{80}$ gr.)

Strophanthinum, U.S.P. (intravenous); mouth, 0.001 Gm. ($\frac{1}{60}$ gr.)

0.001 Gm. ($\frac{1}{60}$ gr.)

Physostigminæ Salicylas, U.S.P.

0.0015 Gm. ($\frac{1}{40}$ gr.)

Strychnina, U.S.P.

Strychninæ Glycerophosphas, N.F.

Strychninæ Nitras, U.S.P.

Strychninæ Sulphas, U.S.P.

Strychninæ Valeras, N.F.

0.002 Gm. ($\frac{1}{80}$ gr.)

Arseni Trioxidum, U.S.P.

0.003 Gm. ($\frac{1}{20}$ gr.)

Apomorphinæ Hydrochloridum, U.S.P. expectorant; emetic, mouth, 0.01 Gm. ($\frac{1}{6}$ gr.); emetic, hypodermic, 0.005 Gm. ($\frac{1}{2}$ gr.)

Diacetylmorphina, U.S.P.

Diacetylmorphinæ Hydrochloridum, U.S.P.

Elaterinum, U.S.P.

Hydrargyri Chloridum Corrosivum, U.S.P.

Hydrargyri Iodidum Rubrum, U.S.P.

Sodii Arsenas Exsiccatus, U.S.P.

0.004 Gm. ($\frac{1}{15}$ gr.)

Hydrargyri Salicylas, U.S.P.

Antimonii et Potassii Tartaras, U.S.P.

Arseni Iodidum, U.S.P.

Auri et Sodii Chloridum, U.S.P.

Iodum, U.S.P.

Pilocarpinæ Hydrochloridum, U.S.P. (hypoderm.); mouth, 0.01 Gm. ($\frac{1}{6}$ gr.)

Pilocarpinæ Nitras, U.S.P. Same as preceding

Sodii Arsenas, U.S.P.

0.006 Gm. ($\frac{1}{10}$ gr.)

Acidum Bromauricum, N.F.

0.008 Gm. ($\frac{1}{6}$ gr.)

Extractum Physostigmatis, U.S.P.

Morphina, U.S.P.

Morphinæ Hydrochloridum, U.S.P.

Morphinæ Sulphas, U.S.P.

0.01 Gm. ($\frac{1}{6}$ gr.)

Argenti Nitras, U.S.P.

Extractum Aconiti, U.S.P.

Extractum Cannabis, U.S.P.

Extractum Gelsemii, U.S.P.

Extractum Stramonii, U.S.P.

Hydrargyri Iodidum Flavum, U.S.P.

Hydrastina, U.S.P.

Hydrastinæ Hydrochloridum, U.S.P.

Resina Podophylli, U.S.P.

Sparteina Sulphas, U.S.P.

Uranii Nitras, U.S.P.

(with caution)

0.015 Gm. ($\frac{1}{4}$ gr.)

Æthylmorphinæ Hydrochloridum, U.S.P.

Aloinum, U.S.P.

Cocaina, U.S.P.

Cocainæ Hydrochloridum, U.S.P.

Extractum Belladonnæ Foliorum, U.S.P.

Extractum Nucis Vomice, U.S.P.

Extractum Podophylli, N.F.

Hydrargyri Chloridum Mite, U.S.P.

0.02 Gm. ($\frac{1}{3}$ gr.)—hypoderm.

Emetinæ Hydrochloridum, U.S.P.

DOSES—Part II. Solids—continued

0.03 Gm. (½ gr.)

Aconitum, U.S.P.
 Chrysarobinum, U.S.P.
 Codeina, U.S.P.
 Codeinæ Phosphas, U.S.P.
 Codeinæ Sulphas, U.S.P.
 Extractum Colocyntidis, U.S.P.
 Extractum Conii, N.F.
 Extractum Ignatiæ, N.F.
 Extractum Opii, U.S.P.
 Gelsemium, U.S.P.
 Hydrastininæ Hydrochloridum, U.S.P.
 Hypophysis Sicca, U.S.P.
 Oleoresina Capsici, U.S.P.
 Oleoresina Piperis, U.S.P.
 Oleoresina Zingiberis, U.S.P.
 Trinitrophenol, U.S.P.
 Trituratio Elaterini, U.S.P.
 Vanillinum, U.S.P.

0.045 Gm. (¾ gr.)

Belladonnæ Radix, U.S.P.

0.06 Gm. (1 gr.)

Antimonii Oxidum, N.F.
 Argenti Oxidum, U.S.P.
 Belladonnæ Folia, U.S.P.
 Calcium Sulphidum Crudum, U.S.P.
 Capsicum, U.S.P.
 Colocyntis, U.S.P.
 Cotarninæ Hydrochloridum, U.S.P.
 Digitalis, U.S.P.
 Extractum Colchici Cormi, U.S.P.
 Extractum Hyoscyami, U.S.P.
 Extractum Quassiae, N.F.
 Ferri Chloridum, U.S.P.
 Ferri Sulphas Exsiccatus, U.S.P.
 Ferrum Reductum, U.S.P.
 Ignatia, N.F.
 Menthol, U.S.P.
 Nux Vomica, U.S.P.
 Opii Pulvis, U.S.P.
 Opium, U.S.P.
 Opium Deodoratum, U.S.P.
 Opium Granulatum, U.S.P.
 Phenol, U.S.P.
 Plumbi Acetas, U.S.P.
 Potassii Permanganas, U.S.P.
 Santoninum, U.S.P.
 Sodii Cacodylas, U.S.P.
 Sodii Nitris, U.S.P.
 Sodii Perboras, U.S.P.
 Staphisagria, U.S.P.
 Stramonium, U.S.P.
 Strophanthus, U.S.P.
 Veratrum Viride, U.S.P.

0.1 Gm. (1½ grs.)

Extractum Fellis Bovis, U.S.P.
 Ferri Sulphas, U.S.P.
 Ferri Sulphas Granulatus, U.S.P.
 Physostigma, U.S.P.
 Quinidina, N.F.
 Quinina, U.S.P.
 Quinina Bisulphas, U.S.P.
 Quinina Dihydrochloridum, U.S.P.

Quinina Glycerophosphas, N.F.
 Quinina Hydrobromidum, U.S.P.
 Quinina Hydrochloridum, U.S.P.
 Quinina Hypophosphis, N.F.
 Quinina Salicylas, U.S.P.
 Quinina Sulphas, U.S.P.
 Quinina Valeras, N.F.
 [The Tonic Dose for Quinidina and Quinina Salts is as above given. The Anti-malarial Dose is 1 Gm. (15 grs.) daily.]

Scilla, U.S.P.

Thyroideum Siccum, U.S.P.

0.125 Gm. (2 grs.)

Adonis, N.F.
 Bismuthi et Ammonii Citras, U.S.P.
 Cambogia, U.S.P.
 Camphora Monobromata, U.S.P.
 Extractum Aloes, N.F.
 Extractum Euonymi, N.F.
 Resina Jalapæ, U.S.P.
 Resorcinol, U.S.P.
 Sanguinaria, U.S.P.
 Zinci Acetas, U.S.P.
 Zinci Phenolsulphonas, U.S.P.
 Zinci Valeras, U.S.P.

0.15 Gm. (2½ grs.)

Caffeina, U.S.P.
 Cinchonidinæ Sulphas, U.S.P.
 Cinchoninæ Sulphas, U.S.P.
 Lobelia, U.S.P.
 Methylthioninæ Chloridum, U.S.P.
 Phenolphthaleinum, U.S.P.

0.2 Gm. (3 grs.)

Acetanilidum, U.S.P.
 Ammonii Hypophosphis, N.F.
 Benzosulphinidum, U.S.P.
 Caffeinæ Sodio-Benzoeas, U.S.P. (hypoderm.); mouth, 0.3 Gm. (5 grs.)
 Caffeinæ Sodio-Salicylas, N.F.
 Camphora, U.S.P. mouth; hypodermic, 0.1 Gm. (1½ grs.)
 Cerii Oxalas, U.S.P.
 Colchici Semen, U.S.P.
 Conium, N.F.
 Extractum Ergotæ Aquosum, N.F.
 Ferri Glycerophosphas, N.F.
 Ferri Hypophosphis, N.F.
 Mangani Citras Solubilis, N.F.
 Mangani Glycerophosphas Solubilis, N.F.
 Mangani Hypophosphis, N.F.
 Mangani Sulphas, N.F.
 Oleoresina Lupulini, N.F.
 Passiflora, N.F.
 Pulvis Antimonialis, N.F.
 Quinina Tannas, U.S.P.
 Resina Scammonii, U.S.P.
 Sodii Benzosulphinidum, U.S.P.

0.25 Gm. (4 grs.)

Aloe, U.S.P.
 Asafœtida, U.S.P.

DOSES—Part II. Solids—continued

- Betanaphthol, U.S.P.
 Calcii Glycerophosphas, U.S.P.
 Caryophyllus, U.S.P.
 Cinnamomum Saigonicum, U.S.P.
 Cinnamomum Zeylanicum, U.S.P.
 Colechici Cormus, U.S.P.
 Cupri Sulphas, U.S.P.
 Extractum Cascaræ Sagradæ, U.S.P.
 Extractum Cimicifugæ, U.S.P.
 Extractum Cinchonæ, N.F.
 Extractum Colocynthis Compositum, U.S.P.
 Extractum Ergotæ, U.S.P.
 Extractum Gentianæ, U.S.P.
 Extractum Leptandrar, N.F.
 Extractum Rhei, U.S.P.
 Extractum Sumbul, U.S.P.
 Ferri Carbonas Saccharatus, U.S.P.
 Ferri et Ammonii Citras, U.S.P.
 Ferri et Quinina Citras, U.S.P.
 Ferri Phosphas, U.S.P.
 Ferri Pyrophosphas, N.F.
 Glycyrrhizinum Ammoniatum, U.S.P.
 Hexamethylenamina, U.S.P.
 Hydrargyrum cum Creta, U.S.P.
 Hyoscymus, U.S.P.
 Iodoformum, U.S.P.
 Mangani Dioxidum Præcipitatum, U.S.P.
 Massa Ferri Carbonatis, U.S.P.
 Massa Hydrargyri, U.S.P.
 Moschus, U.S.P.
 Pelletierina Tannas, U.S.P.
 Potassii Chloras, U.S.P.
 Scammonia Radix, U.S.P.
 Sodii Carbonas Monohydratus, U.S.P.
 Sodii Glycerophosphas, U.S.P.
 Sodii Phenolsulphonas, U.S.P.
 Suprarenalum Siccum, U.S.P.
 Terpini Hydras, U.S.P.
 Theophyllina, U.S.P.
- 0.3 Gm. (5 grs.)**
- Acetphenetidinum, U.S.P.
 Alumini Chloridum, N.F.
 Ammonii Carbonas, U.S.P.
 Ammonii Chloridum, U.S.P.
 Ammonii Iodidum, U.S.P.
 Ammonii Phosphas, N.F.
 Antipyrina, U.S.P.
 Caffeina Citrata, U.S.P.
 Ferri Lactas, N.F.
 Paracoto, N.F.
 Phenylis Salicylas, U.S.P.
 Potassii Iodidum, U.S.P.
 Pulsatilla, N.F.
 Pulvis Acetanilidi Compositus, N.F.
 Pulvis Aloes et Canellæ, N.F.
 Pulvis Rhei et Magnesiae Anisatus, N.F.
 Sodii Iodidum, U.S.P.
 Strontii Iodidum, U.S.P.
- 0.5 Gm. (8 grs.)**
- Acidum Benzoicum, U.S.P.
 Acidum Boricum, U.S.P.
 Acidum Citricum, U.S.P.
 Acidum Phenylcinchoninicum, U.S.P.
 Acidum Tannicum, U.S.P.
 Acidum Tartaricum, U.S.P.
 Alumen, U.S.P.
 Ammonii Salicylas, U.S.P.
 Ammonii Valeras, U.S.P.
 Anisum, U.S.P.
 Bismuthi Betanaphtholas, U.S.P.
 Bismuthi Subcarbonas, U.S.P.
 Bismuthi Subgallas, U.S.P.
 Bismuthi Subnitrates, U.S.P.
 Bismuthi Subsali-cylas, U.S.P.
 Boldo, N.F.
 Calcii Chloridum, U.S.P.
 Calcii Hypophosphis, U.S.P.
 Calcii Lactas, U.S.P.
 Calcii Lactophosphas, N.F.
 Caulophyllum, N.F.
 Chloralum Hydratum, U.S.P.
 Convallariae Flores, N.F.
 Convallariae Radix, N.F.
 Coriandrum, U.S.P.
 Diastase, U.S.P.
 Euonymus, N.F.
 Extractum Hydrastis, U.S.P.
 Extractum Krameria, N.F.
 Extractum Viburni Prunifolii, U.S.P.
 Galla, U.S.P.
 Kino, U.S.P.
 Lithii Carbonas, U.S.P.
 Lithii Citras, U.S.P.
 Lupulinum, N.F.
 Macis, N.F.
 Myrica, N.F.
 Myristica, U.S.P.
 Myrrha, U.S.P.
 Oleoresina Cubebæ, U.S.P.
 Pancreatinum, U.S.P.
 Paraformaldehydum, U.S.P.
 Pepsinum, U.S.P.
 Piper, U.S.P.
 Pix Liquida, U.S.P.
 Potassii Hypophosphis, U.S.P.
 Potassii Nitrates, U.S.P.
 Pulvis Ipecacuanhæ et Opii, U.S.P.
 Quassia, U.S.P.
- 0.6 Gm. (10 grs.)**
- Agaricus, N.F.
 Corydalis, N.F.
 Extractum Ferri Pomatum, N.F.
 Fucus, N.F.
- 0.75 Gm. (12 grs.)**
- Acidum Salicylicum, U.S.P.
 Apocynum, N.F.
 Sodii Boras, U.S.P.
 Sulphonethylmethanum, U.S.P.
 Sulphonmethanum, U.S.P.

DOSES—Part II. Solids—continued

1 Gm. (15 grs.)

Acidum Gallicum, U.S.P.
 Ethylis Carbamas, U.S.P.
 Ammonii Benzoas, U.S.P.
 Ammonii Bromidum, U.S.P.
 Angelicæ Fructus, N.F.
 Aurantii Amari Cortex, U.S.P.
 Baptisia, N.F.
 Benzoinum, U.S.P.
 Bryonia, N.F.
 Calcii Bromidum, U.S.P.
 Calcii Carbonas Præcipitatus, U.S.P.
 Calcii Phosphas Præcipitatus, N.F.
 Carbo Ligni, U.S.P.
 Cardamomi Semen, U.S.P.
 Carum, U.S.P.
 Cascara Sagrada, U.S.P.
 Chirata, N.F.
 Cimicifuga, U.S.P.
 Cinchona, U.S.P.
 Cinchona Rubra, U.S.P.
 Cocillana, N.F.
 Creosoti Carbonas, U.S.P.
 Creta Præparata, U.S.P.
 Cubeba, U.S.P.
 Cypripedium, N.F.
 Echinacea, N.F.
 Eriodictyon, U.S.P.
 Extractum Hamatoxyli, N.F.
 Extractum Jalapæ, N.F.
 Extractum Taraxaci, U.S.P.
 Fœniculum, U.S.P.
 Frangula, U.S.P.
 Galangal, N.F.
 Gambir, U.S.P.
 Gentiana, U.S.P.
 Geranium, N.F.
 Guaiacolis Carbonas, U.S.P.
 Guaiacum, U.S.P.
 Ipecacuanha, U.S.P.
 Jalapa, U.S.P.
 Kava, N.F.
 Krameria, N.F.
 Lactucarium, U.S.P.
 Leptandra, N.F.
 Lithii Bromidum, U.S.P.
 Lithii Salicylas, N.F.
 Massa Copaibæ, N.F.
 Menyanthes, N.F.
 Papaveris Fructus, N.F.
 Pepsinum Saccharatum, N.F.
 Phytolacca, N.F. emetic; alterative, 0.1 Gm. (1½ grs.)
 Pimenta, N.F.
 Pimpinella, N.F.
 Potassii Acetas, U.S.P.
 Potassii Bicarbonas, U.S.P.
 Potassii Bromidum, U.S.P.
 Potassii Carbonas, U.S.P.
 Potassii Citras, U.S.P.
 Potassii Sulphas, N.F.
 Pulvis Aromaticus, U.S.P.
 Pulvis Cretæ et Opii Aromaticus, N.F.
 Pulvis Hydrargyri Chloridi Mitis et Jalapæ, N.F.

Pulvis Myricæ Compositus, N.F.
 Quercus, N.F.
 Quinins et Ureæ Hydrochloridum, U.S.P. (hypodermic)
 Rhamnus Cathartica, N.F.
 Rheum, U.S.P.
 Rhus Glabra, N.F.
 Rubus, N.F.
 Sabal, U.S.P.
 Sal Carolinum Factitium, N.F., dry; cryst., 1.75 Gm. (26 grs.)
 Sal Vichyanum Factitium, N.F.
 Salicinum, U.S.P.
 Scoparius, N.F.
 Scutellaria, N.F.
 Senega, U.S.P.
 Serpentaria, U.S.P.
 Sodii Acetas, U.S.P.
 Sodii Benzoas, U.S.P.
 Sodii Bicarbonas, U.S.P.
 Sodii Bromidum, U.S.P.
 Sodii Citras, U.S.P.
 Sodii Hypophosphis, U.S.P.
 Sodii Salicylas, U.S.P.
 Sodii Sulphis Exsiccatus, U.S.P.
 Sodii Thiosulphas, U.S.P.
 Strontii Bromidum, U.S.P.
 Strontii Salicylas, U.S.P.
 Styrax, U.S.P.
 Theobrominæ Sodio-Salicylas, U.S.P.
 Thymol, U.S.P., anthelmintic; anti-septic, 0.125 Gm. (2 grs.)
 Verbena, N.F.
 Xanthoxyli Fructus, N.F.
 Zedoaria, N.F.
 Zinci Sulphas, U.S.P.
 Zingiber, U.S.P.

1.3 Gm. (20 grs.)

Pulvis Gambir Compositus, N.F.
 Species Laxativæ, N.F.

1.5 Gm. (23 grs.)

Sal Kissingense Factitium, N.F.

2 Gm. (30 grs.)

Absinthium, N.F.
 Aletris, N.F.
 Allium, N.F.
 Althæa Folia, N.F.
 Angelicæ Radix, N.F.
 Apii Fructus, N.F.
 Aralia, N.F.
 Asarum, N.F.
 Asclepias, N.F.
 Berberis, N.F.
 Buchu, U.S.P.
 Calumba, U.S.P.
 Canella, N.F.
 Cascarella, N.F.
 Centaurium, N.F.
 Chimaphila, N.F.
 Chionanthus, N.F.
 Coptis, N.F.
 Cornus, N.F.
 Damiana, N.F.
 Ergota, U.S.P.

DOSES—Part II. Solids—continued

- Eucalyptus, U.S.P.
 Eupatorium, N.F.
 Euphorbia Pilulifera, N.F.
 Fraxinus, N.F.
 Glycyrrhiza, U.S.P.
 Gossypii Cortex, N.F.
 Granatum, U.S.P.
 Grindelia, U.S.P.
 Guarana, U.S.P.
 Hamamelidis Folia, N.F.
 Helonias, N.F.
 Humulus, U.S.P.
 Hydrangea, N.F.
 Hydrastis, U.S.P.
 Inula, N.F.
 Iris Versicolor, N.F.
 Lappa, N.F.
 Magnesii Oxidum, U.S.P.
 Magnesii Oxidum Ponderosum, U.S.P.
 Mastiche, N.F.
 Oleoresina Aspidii, U.S.P.
 (single dose, once a day)
 Pareira, N.F.
 Petroselin Radix, N.F.
 Pilocarpus, U.S.P.
 Pinus Alba, N.F.
 Potassii Bitartras, U.S.P.
 Prunus Virginiana, U.S.P.
 Pulvis Oretæ Aromaticus, N.F.
 Pulvis Oretæ Compositus, U.S.P.
 Pulvis Jalapæ Compositus, U.S.P.
 Pulvis Kino et Opii Compositus, N.F.
 Pulvis Rhei Compositus, U.S.P.
 Pyrethrum, U.S.P.
 Sarsaparilla, U.S.P.
 Sodii Boro-Benzoeas, N.F.
 Sodii Phosphas Exsiccatus, U.S.P.
 Stillingia, U.S.P.
 Sumbul, U.S.P.
 Thuja, N.F.
 Trillium, N.F.
 Uva Ursi, U.S.P.
 Valeriana, U.S.P.
 Viburnum Opulus, N.F.
 Viburnum Prunifolium, U.S.P.
 Xanthoxylum, U.S.P.
- 3 Gm. (45 gra.)**
 Magnesii Carbonas, U.S.P.
- 4 Gm. (60 gra.)**
 Aspidium, U.S.P.
 Aspidosperma, U.S.P.
 Caffeina Citrata Effervescens, U.S.P.
 Cassia Fistula, N.F.
 Castanea, N.F.
 Cataria, N.F.
 Condurango, N.F.
 Confectio Sennæ, N.F.
 Dioscorea, N.F.
 Drosera, N.F.
 Dulcamara, N.F.
 Farfara, N.F.
 Galega, N.F.
 Guaiaci Lignum, N.F.
- Helianthemum, N.F.
 Juglans, N.F.
 Juniperus, N.F.
 Kola, N.F.
 Matico, N.F.
 Mentha Piperita, U.S.P.
 Mentha Viridis, U.S.P.
 Potassii Citras Effervescens, U.S.P.
 Pulvis Glycyrrhizæ Compositus, U.S.P.
 Rumex, N.F.
 Sal Vichyanum Factitium Effervescens, N.F.
 Sambucus, N.F.
 Senecio, N.F.
 Senna, U.S.P.
 Sodii Phosphas, U.S.P.
 Solanum, N.F.
 Species Pectorales, N.F.
 Spigelia, U.S.P.
 Sulphur Lotum, U.S.P.
 Sulphur Præcipitatum, U.S.P.
 Sulphur Sublimatum, U.S.P.
 Thymus, N.F.
 Trifolium, N.F.
 Verbasci Folia, N.F.
 Zea, N.F.
- 5.5 Gm. (80 gra.)**
 Sal Kissingense Factitium Effervescens, N.F.
- 6 Gm. (90 gra.)**
 Sal Carolinum Factitium Effervescens, N.F.
 Sal Potassii Bromidi Effervescens, N.F.
 Sal Potassii Bromidi Effervescens Compositus, N.F.
 Sal Vichyanum Factitium Effervescens cum Lithio, N.F.
- 8 Gm. (120 gra.)**
 Sal Lithii Citratis Effervescens, N.F.
 Triticum, U.S.P.
 Verbasci Flores, N.F.
- 10 Gm. (150 gra.)**
 Agar, U.S.P.
 Potassii et Sodii Tartras, U.S.P.
 Sassafras, U.S.P.
 Sinapis Alba, U.S.P.
 Sinapis Nigra, U.S.P.
 Sodii Phosphas Effervescens, U.S.P.
 Taraxacum, U.S.P.
- 15 Gm. (240 gra.)**
 Brayera, N.F.
 Chondrus, U.S.P.
 Extractum Malti, U.S.P.
 Magnesii Chloridum, N.F.
 Magnesii Sulphas, U.S.P.
 Manna, U.S.P.
 Matricaria, U.S.P.
 Sodii Chloridum, U.S.P.
 Sodii Sulphas, U.S.P.
 Tamarindus, N.F.

DOSES—Part II. Solids—continued

30 Gm. (480 grs.)

Pepo, U.S.P.

1 pill

Pilulæ ad Prandium, N.F.
Pilulæ Aloes et Asafetidæ, N.F.

Pilulæ Aloes et Podophylli

Compositæ, N.F.

Pilulæ Aloes, Hydrargyri et
Podophylli, N.F.

Pilulæ Aloes, Hydrargyri et
Scammonii Compositæ, N.F.

Pilulæ Aloini Compositæ, N.F.

Pilulæ Aloini, Strychninæ et
Belladonnæ, N.F.

Pilulæ Aloini, Strychninæ et

Belladonnæ Compositæ, N.F.

Pilulæ Antidyspepticæ, N.F.

Pilulæ Antimonii Compositæ, N.F.

Pilulæ Antiperiodicæ, N.F.

Pilulæ Antiperiodicæ sine Aloe,
N.F.

Pilulæ Colocynthis Compositæ,
N.F.

Pilulæ Colocynthis et Hyoscyami,

N.F.

Pilulæ Colocynthis et Podo-
phylli, N.F.

Pilulæ Digitalis, Scillæ et

Hydrargyri, N.F.

Pilulæ Ferri, Quininæ, Aloes et
Nucis Vomice, N.F.

Pilulæ Ferri, Quininæ, Strych-

ninæ et Arseni Fortiores, N.F.

Pilulæ Ferri, Quininæ, Strych-

ninæ et Arseni Mites, N.F.

Pilulæ Glycerylis Nitratis, N.F.

Pilulæ Laxativæ Post Partum,
N.F.

Pilulæ Opii, Digitalis et Quininæ,
N.F.

Pilulæ Opii et Camphoræ, N.F.

Pilulæ Opii et Plumbi, N.F.

Pilulæ Phosphori, U.S.P.

Pilulæ Rhei, N.F.

2 pills

Pilulæ Aloes, U.S.P.

Pilulæ Aloes et Ferri, N.F.

Pilulæ Aloes et Mastiches, N.F.

Pilulæ Aloes et Myrrhæ, N.F.

Pilulæ Asafetidæ, U.S.P.

Pilulæ Catharticæ Compositæ,
U.S.P.

Pilulæ Catharticæ Vegetabiles,
N.F.

Pilulæ Ferri Carbonatis, U.S.P.

Pilulæ Ferri Iodidi, U.S.P.

Pilulæ Laxativæ Compositæ, N.F.

Pilulæ Rhei Compositæ, U.S.P.

1 set of 2 powders

Pulvis Effervescens Compositus,
U.S.P.

1 troche

Trochisci Carbonis Ligni, N.F.

Trochisci Gambir, N.F.

Trochisci Menthæ Piperitæ, N.F.

Trochisci Phenolphthaleini, N.F.

Trochisci Quininæ Tannatis, N.F.

Trochisci Santonini, N.F.

Trochisci Santonini Compositi,
N.F.

Trochisci Sulphuris et Potassii
Bitartratis, N.F.

Trochisci Ulmi, N.F.



Collection of original packages of American drugs.

INDEX

A

- Absinthium, 351
- Absorbent Cotton, 571
- Acacia, 585
- Acacia Senegal, 585
- Aconite, 175
- Aconitum, 175
- Aconitum Napellus, 175
- Adeps, 643
- Adeps Lanae, 643
- Adonis, 313
- Adonis Vernalis, 313
- African Cannabis, 355
- African Ginger, 81
- African Pepper, 467
- Agar, 587
- Agar-Agar, 587
- Agaric, 563
- Agaricus, 563
- Agropyron repens, 145
- Ague Tree Bark, 205
- Ague Tree Pith, 269
- Aleppo Galls, 575
- Aletris, 151
- Aletris farinosa, 151
- Alexandria Senna, 411
- Algæ, 551
- Algæ and Fungi, 551
- Allium, 185
- Allium sativum, 185
- Allspice, 453
- Almond, 537
- Aloe, 621, 623, 625
- Aloe ferox, 625
- Aloe Perryi, 621
- Aloe vera, 623
- Aloes, 621, 623, 625
- Alpinia officinarum, 91
- Althæa, 41
- Althæa Folia, 397
- Althæa Leaves, 397
- Althæa officinalis, 41, 397
- American Angelica, 125
- American Aspidium, 95
- American Burdock, 51
- American Cannabis, 353
- American Elder, 423
- American Male Fern, 95
- American Pulsatilla, 319
- American Spikenard Root, 163
- American White Hellebore, 129
- Amygdala Dulcis, 537
- Amylum, 579
- Anacylus Pyrethrum, 49
- Anamirta Cocculus, 471
- Anemone Ludoviciana, 319
- Anemone pratense, 317
- Angelica Archangelica, 127, 477
- Angelica atropurpurea, 125
- Angelica Fruit, 477
- Angelica Root, 125, 127
- Angelica Seed, 477
- Angelica Fructus, 477
- Angelica Radix, 125, 127
- Anhydrous Lanolin, 643
- Anise, 479
- Aniseed, 479
- Anisum, 479
- Annam Cinnamon, 245
- Apii Fructus, 485
- Apocynum, 117
- Apocynum Cannabinum, 117
- Apis mellifera, 637, 638
- Apple Juice, 509
- Apium graveolens, 485
- Aralia, 163
- Aralia racemosa, 163
- Arbor Vita, 277
- Arctium Lappa, 53
- Arctium minus, 51
- Arctostaphylos Uva-ursi, 373
- Aristolochia reticulata, 157
- Aristolochia Serpentaria, 159
- Arkangel, 127
- Arnica, 433
- Arnica Flowers, 433
- Arnica montana, 433
- Artemisia Absinthium, 351
- Asafetida, 597
- Asafetida, 597
- Asarum, 141
- Asarum canadense, 141
- Asclepias, 43
- Asclepias tuberosa, 43
- Aspidium, 95, 97
- Aspidosperma, 209
- Aspidosperma Quebracho blanco, 209
- Assays, 653
- Asthma Weed, 295
- Astragalus gummifer, 583
- Atropa Belladonna, 55, 327
- Aurantii Amari Cortex, 463
- Aurantii Dulcis Cortex, 459

B

Balm of Gilead Buds, 359
 Balsam of Copaiba, 605
 Balsam of Peru, 602
 Balsam Poplar Buds, 359
 Balsam of Tolu, 603
 Balsamic Resins, 589
 Balsams, 589
 Balsamum Peruvianum, 602
 Balsamum Tolutanum, 603
 Baptisia, 23
 Baptisia tinctoria, 23
 Barks, 188
 Barley Malt, 457
 Barosma betulina, 375
 Barosma serratifolia, 377
 Bayberry Bark, 199
 Bearberry, 373
 Beeswax, 637
 Belladonna Leaves, 327
 Belladonna Root, 55
 Belladonnae Folia, 327
 Belladonnae Radix, 55
 Benzoin, 611
 Benzoinum, 611
 Berberis, 105
 Beth Root, 99
 Bicutella canadensis, 181
 Bicutella Ocularia, 183
 Bitter Apple, 465
 Bitter Orange Peel, 463
 Bitter Stick, 285
 Bittersweet, 279
 Bitter Wood, 259
 Blackberries, 503
 Blackberry Bark, 207
 Black Cherry Bark, 241
 Black Cohosh, 137
 Black Haw, 227
 Black Mustard, 541

Black Pepper, 451
 Black Poplar Buds, 361
 Black Snakeroot, 137
 Bladder Fucus, 553
 Bladderwrack, 553
 Blazing Star, 161
 Bloodroot, 149
 Blue Cohosh, 133
 Blue Flag, 71
 Blue Gum Leaves, 365
 Blue Vervain, 307
 Bogbean, 403
 Boldo, 371
 Boldo Boldus, 371
 Boneset, 347
 Bos taurus, 639, 645
 Brandy Mint, 331
 Brassica nigra, 541
 Brauneria pallida, 115
 Brayera, 425
 Brazilian Ipecac, 47
 Broad-leaved Gum Plant, 341
 Broad-leaved Rumex, 39
 Broom Tops, 275
 Brown Mustard, 541
 Brown Sarsaparilla, 19
 Brown Strophanthus, 531
 Bryonia, 63
 Bryonia alba, 63
 Bryonia dioica, 63
 Bryony Root, 63
 Buchu, 375, 377
 Buckbean, 403
 Buckthorn Bark, 223
 Buckthorn Berries, 455
 Burdock Root, 51, 53
 Burning Bush, 197
 Butterfly Weed Root, 43
 Butternut Bark, 203

C

Cactus Grandiflorus, 273
 Calabar Bean, 535
 Calcutta Ginger, 83
 Calendula, 435
 Calendula officinalis, 435
 Calicut Ginger, 85
 Calisaya Bark, 211
 Calumba, 61
 Cambogia, 599
 Camphor, 629
 Camphora, 629
 Camphora, 612
 Canada Snakeroot, 141
 Canadian Hemp, 117
 Candle Berry, 199
 Cane Ash, 239
 Canella, 225
 Canella Winterana, 225
 Canker-root, 297
 Cannabis, 353, 355, 357
 Cannabis indica, 355, 357
 Cannabis sativa, 353
 Cantharides, 633

Cantharis, 633
 Cantharis vesicatoria, 633
 Cape Aloes, 625
 Capsicum, 467
 Capsicum frutescens, 467
 Caraway Seed, 475
 Carbo Ligni, 269
 Cardamom Seed, 533
 Cardamomi Semen, 533
 Carrageen, 555, 557
 Cartagena Ipecac, 45
 Carum, 475
 Carum Carvi, 475
 Caryophyllus, 417
 Cascara Bark, 243
 Cascara Sagrada, 243
 Cascarilla, 239
 Cassia acutifolia, 411
 Cassia angustifolia, 409
 Cassia Fistula, 439
 Cassia Pods, 489
 Castanea, 385
 Castanea dentata, 385

Cataria, 345
 Catechu, 627
 Cathartocarpus Fistula, 489
 Catmint, 345
 Catnep, 345
 Catnip, 345
 Caulophyllum, 133
 Caulophyllum thalictroides, 133
 Cayenne Pepper, 467
 Celery Fruit, 485
 Celery Seed, 485
 Centaurium, 301
 Centaury, 301
 Cephaelis acuminata, 45
 Cephaelis Ipecacuanha, 47
 Cera Flava, 637
 Cereus grandiflorus, 273
 Cerevisiae Fermentum Com-
 pressum, 559
 Cetaceum, 635
 Ceylon Cinnamon, 255
 Chamelirium luteum, 161
 Chamomile, 437
 Charcoal, 269
 Cheeses, 393
 Chestnut Leaves, 385
 Chillies, 467
 Chimaphila, 379
 Chimaphila umbellata, 379
 Chionanthus, 195
 Chionanthus virginica, 195
 Chirata, 285
 Chirayta, 285
 Chiretta, 285
 Chittim Bark, 243
 Chondodendron tomentosum, 29
 Chondrus, 555, 557
 Chondrus Crispus, 555
 Cider, 509
 Cimicifuga, 137
 Cimicifuga racemosa, 137
 Cinchona, 211
 Cinchona Calisaya, 211
 Cinchona Ledgeriana, 211
 Cinchona Rubra, 213
 Cinchona succirubra, 213
 Cinnamomum Camphora, 629
 Cinnamomum Saigonicum, 245
 Cinnamomum Zeylanicum, 255
 Citrullus Colocynthis, 465
 Citrus Aurantium sinensis, 459
 Citrus Aurantium amara, 463
 Citrus medica acida, 509
 Citrus medica Limonum, 461
 Claviceps purpurea, 565
 Clove, 417
 Clove Pepper, 453
 Club Moss, 569
 Coal Tar, 639
 Coccionella, 631
 Cocculus Indicus, 471
 Coccus, 631
 Coccus cacti, 631
 Cochineal, 631
 Cochui Ginger, 87
 Cocillana, 215
 Coffea arabica, 519
 Coffea liberica, 519
 Coffea Tosta, 519
 Coffee, 519
 Cola, 547
 Colchici Cormus, 187
 Colchici Semen, 525
 Colchicum autumnale, 187, 525
 Colchicum Corm, 187
 Colchicum Root, 187
 Colchicum Seed, 525
 Colocynth, 465
 Colocynth Apple, 465
 Colocynth Pulp, 465
 Colocynthis, 465
 Colombia Ipecac, 45
 Colombo, 61
 Colophony, 591
 Coltsfoot, 399
 Columba, 61
 Columbo, 61
 Commiphora, 601
 Common Parsley, 57
 Common Sundew, 287
 Common Thyme, 325
 Common Turpentine, 609
 Condurango, 219
 Conium, 483
 Conium maculatum, 483
 Consumptive's Weed, 387
 Convallaria Flowers, 421
 Convallaria majalis, 143, 421
 Convallaria Root, 143
 Convallaria Flores, 421
 Convallaria Radix, 143
 Convolvulus Scammonia, 31
 Copsiba, 605
 Copaiva, 605
 Ooptis, 297
 Ooptis trifolia, 297
 Coriander Seed, 487
 Coriandrum, 487
 Coriandrum sativum, 487
 Corn Silk, 431
 Corn Starch, 579
 Cornus, 193
 Cornus florida, 193
 Corydalis, 181, 183
 Cotton, 571
 Cotton Root Bark, 201
 Couch Grass, 145
 Cramp Bark, 229
 Cranesbill, 77
 Crocus, 429
 Crocus sativus, 429
 Croton Eluteria, 283
 Cubebs, 449
 Cubebs, 449
 Cucurbita Pepo, 539
 Cudbear, 561
 Culver's Physic, 135
 Culver's Root, 135
 Curaçao Aloes, 623
 Curcuma Zedoaria, 93
 Curled Dock, 37
 Curled Rumex, 37
 Cusso, 425
 Cyprripedium, 147
 Cyprripedium hirsutum, 147
 Cyprripedium parviflorum, 147
 Cyprripedium pubescens, 147
 Oytisis scoparius, 275

D

- Damiana, 381, 388
 Dandelion, 121
 Daphne Gnidium, 231
 Daphne Laureola, 231
 Daphne Mezereum, 231
 Datura Stramonium, 401
 Datura Tatula, 401
 Deadly Nightshade Leaves, 327
 Deadly Nightshade Root, 55
 Deer Musk, 644
 Delphinium, 523
 Delphinium Ajacia, 523
 Delphinium Consolida, 523
 Delphinium Staphisagria, 521
 Desiccated Hypophysis, 641
 Desiccated Pituitary Body, 641
 Desiccated Suprarenals, 640
 Desiccated Thyroid Glands, 645
 Diastase, 638
 Diastase of Malt, 638
 Diastaseum, 638
 Digitalis, 389
 Digitalis purpurea, 389
 Dioscorea, 69
 Dioscorea villosa, 69
 Dock, Curled, 37
 Dock Root, Broad-leaved, 39
 Dock Root, Yellow, 39
 Dog Buttons, 515
 Dog Grass, 145
 Dogwood Bark, 193
 Dose Tables, 663
 Dried Juices, 612
 Dried Suprarenals, 640
 Dried Thyroids, 645
 Drosera, 287, 289, 291
 Drosera intermedia, 289
 Drosera longifolia, 291
 Drosera rotundifolia, 287
 Drugs of Animal Origin, 631
 Dryopteris Filix-mas, 97
 Dryopteris marginalis, 95
 Dulcamara, 279
 Dutchman's Breeches, 183

E

- Ecballium Elaterium, 617
 Echinacea, 115
 Echinacea angustifolia, 115
 Elaterin, 617
 Elaterinum, 617
 Elder Flowers, 423
 Elecampane, 123
 Elettaria Cardamomum, 533
 Elm, 237
 Elm Bark, 237
 Ergot, 565
 Ergota, 565
 Eriodictyon, 387
 Eriodictyon californicum, 387
 Erythraea Centaurium, 301
 Eucalyptus, 365
 Eucalyptus Globulus, 365
 Eugenia aromatica, 417
 Euonymus, 197
 Euonymus atropurpureus, 197
 Eupatorium, 347
 Eupatorium perfoliatum, 347
 Euphorbia Pilulifera, 295
 European Angelica Root, 127
 European Aspidium, 97
 European Burdock, 53
 European Century Herb, 301
 European Goat's Rue, 329
 European Lappa, 53
 European Male Fern, 97
 European Pasque Flower, 317
 European Pulsatilla, 317
 Evening Trumpet Flower, 107
 Excrescences, 567
 Exogonium Purga, 177
 Extracts, 612

F

- False Hellebore, 313
 False Unicorn, 161
 Farfara, 399
 Fel Bovis, 639
 Fennel Seed, 473
 Ferula Asafoetida, 597
 Ferula foetida, 597
 Ferula Sumbul, 171
 Ficus, 501
 Ficus Carica, 501
 Field Larkspur, 523
 Fig, 501
 Fish-berry, 471
 Flaxseed, 527
 Florentine Orris Root, 73
 Flower Heads, 414
 Flowering Ash, 195
 Flowering Dogwood, 193
 Flowering Tops, 321
 Flowers, 412
 Foeniculum, 473
 Foeniculum vulgare, 473
 Foreign Burdock, 53
 Foreign Dandelion, 121
 Foxglove, 389
 Frangula, 223
 Fraxinum Americana, 239
 Fraxinus, 239
 Fraxinus Ornus, 581
 French Rose, 427
 Fringe Tree Bark, 195
 Frost-weed, 299
 Fruits, 440
 Fucus vesiculosus, 553
 Fucus, 553
 Fungi, 551

G

- Galanga, 91
 Galangal, 91
 Galega, 329
 Galega officinalis, 329
 Galla, 575
 Gambir, 627
 Gambooge, 599
 Garcinia Hanburii, 599
 Garden Angelica, 127
 Garden Mint, 333
 Garden Parsley, 57
 Garden Thyme, 325
 Garden Valerian, 131
 Garlic, 185
 Gelidium, 587
 Gelsemium, 107
 Gelsemium sempervirens, 107
 Gentian, 119
 Gentiana, 119
 Gentiana lutea, 119
 Georgia Pine Rosin, 591
 Geranium, 77
 Geranium maculatum, 77
 German Chamomile, 437
 Gigartina mamilliosa, 557
 Ginger, 79, 81, 83, 85, 87, 89
 Gloiopeltis, 587
 Glossary, 647
 Glycyrrhiza, 111, 113
 Glycyrrhiza glabra glandulifera, 111
 Glycyrrhiza glabra typica, 113
 Golden Ragroot, 309
 Golden Seal, 153
 Goldthread, 297
 Gossypii Cortex, 201
 Gossypium arboreum, 201
 Gossypium Barbadenae, 201
 Gossypium herbaceum, 201, 571
 Gossypium Purificatum, 571
 Gracilaria (Sphaerococcus)
 Lichenoides, 587
 Granatum, 221
 Gray Sarsaparilla, 17
 Great Angelica, 125
 Green Hellebore, 129
 Green Strophanthus, 529
 Grindelia, 337, 339, 341
 Grindelia Camporum, 337
 Grindelia Cuneifolia, 339
 Grindelia Squarrosa, 341
 Guaiac, 593
 Guaiac Resin, 593
 Guaiac Wood, 265
 Guaiaci Lignum, 265
 Guaiacum, 593
 Guaiacum officinale, 265, 593
 Guaiacum sanctum, 265, 593
 Guajah, 357
 Guapi Bark, 215
 Guarana, 545
 Guarea Rusbyi, 215
 Guaza, 357
 Gum Acacia, 585
 Gum Arabic, 585
 Gum Asafetida, 597
 Gum Benjamin, 611
 Gum Benzoin, 611
 Gum Camphor, 629
 Gum Kino, 619
 Gum Myrrh, 601
 Gum Opium, 613
 Gum Plant, 337
 Gum Resins, 589
 Gum Senegal, 585
 Gum Thus, 609
 Gum Tragacanth, 583
 Gummi Plasticum, 617
 Gums, 577
 Gutta Percha, 617
 Gutta Taban, 617

H

- Hamatoxylon, 267
 Hamatoxylon campechianum, 267
 Hagenia abyssinica, 425
 Hairs, Glandular, 567
 Hairs, Non-glandular, 567
 Hamamelidis Folia, 391
 Hamamelis virginiana, 391
 Hard Paraffin, 640
 Helianthemum, 299
 Helianthemum canadense, 299
 Helonias, 161
 Hellebore, 129
 Henbane, 349
 Herbs, 303
 High Bush Blackberries, 503
 High Bush Cranberry Bark, 229
 High Mallow, 395
 Holigold, 435
 Honduras Sarsaparilla, 19
 Honey, 638
 Honeysuckle Clover Blossoms, 439
 Hoodwort, 293
 Hordeum sativum, 457
 Horsehead, 123
 Horse-nettle Berries, 469
 Horse Savin Berries, 497
 Humulus, 499
 Humulus Lupulus, 499, 573
 Hydrangea, 109
 Hydrangea arborescens, 109
 Hydrastis, 153
 Hydrastis canadensis, 153
 Hyoscyamus, 349
 Hyoscyamus niger, 349
 Hypophysis Sicca, 641

I

Ignatia, 517
 Ignatia Amara, 517
 Indian Berry, 471
 Indian Cannabis, 357
 Indian Pink, 155
 Indian Senna, 409
 Indian Tobacco, 343
 Indigo, Red, 561
 Indigo, Wild, 23
 Inkberry Root, 33
 Intermediate Drosera, 289

Intermediate Sundew, 289
 Inula, 123
 Inula Helenium, 123
 Ipecac, 45, 47
 Ipecacuanha, 45, 47
 Iris, 73, 75
 Iris florentina, 73
 Iris germanica, 75
 Iris Root, 71
 Iris Versicolor, 71
 Irish Moss, 555, 557

J

Jaborandi, 405, 407
 Jalap, 177
 Jalapa, 177
 Jamaica Ginger, 79
 Jamaica Quassia, 259
 Jamaica Sarsaparilla, 21
 Jambosa Caryophyllus, 417
 Japanese Ginger, 89

Japanese Isinglass, 587
 Jateorhiza palmata, 61
 Jimson Weed, 401
 Juglans, 203
 Juglans cinerea, 203
 Juniper Berries, 497
 Juniperus, 497
 Juniperus communis, 497

K

Kava, 169
 Kava Kava, 169
 Kino, 619
 Knight's-spur, 523
 Kola, 547

Kola-nut, 547
 Kousoo, 425
 Krameria, 25, 27
 Krameria Ixina, 27
 Krameria triandra, 25

L

Lactuca virosa, 615
 Lactucarium, 615
 Lady Slipper Root, 147
 Lamb Mint, 331
 Lanolin, Anhydrous, 643
 Lappa, 51, 58
 Larch Agaric, 563
 Larch Turpentine, 607
 Lard, 643
 Large-leaved Jaborandi, 405
 Large-leaved Pilocarpus, 405
 Larix Europaea, 607
 Larkspur Seed, 523
 Latex, 612
 Leaves, 303, 321, 362
 Leaves and Flowering Tops, 321
 Lecanora Acharius, 561
 Lemon Ginger, 85
 Lemon Peel, 461
 Leptandra, 135
 Lesser Centaury, 301
 Lettuce Opium, 615
 Licorice, 111, 113
 Liferoot, 309
 Lignum Sanctum, 265
 Lignum Vitae, 265

Lily-of-the-Valley Flowers, 421
 Lily-of-the-Valley Root, 143
 Lime Juice, 509
 Limonis Cortex, 461
 Linseed, 527
 Linum, 527
 Linum usitatissimum, 527
 Lion's Tooth, 121
 Liquidambar orientalis, 604
 Liquid Paraffin, 642
 Liquid Petrolatum, 642
 Liquid Storax, 604
 Liquorice Root, 111, 113
 Lobelia, 343
 Lobelia inflata, 343
 Logwood, 267
 Long Buchu, 377
 Long-leaved Drosera, 291
 Long-leaved Sundew, 291
 Low Mallow, 393
 Lupulin, 573
 Lupulinum, 573
 Lupulus, 499
 Lycopodium, 569
 Lycopodium clavatum, 569

M

Mace, 549
 Macis, 549
 Macrotye, 137
 Madweed, 293
 Male Fern, 95, 97
 Mallow Leaves, 393, 395
 Malt, 457
 Maltum, 457
 Malva Folia, 393, 395
 Malva rotundifolia, 393
 Malva sylvestris, 395
 Mandrake, 139
 Manna, 581
 Maranham Jaborandi, 407
 Marigold, 435
 Marsdenia Condurango, 219
 Marshmallow Leaves, 397
 Marshmallow Root, 41
 Marsh Trefoil, 403
 Mary-bud, 435
 Mastic, 595
 Mastiche, 595
 Mastix, 595
 Matico, 369
 Matricaria, 437
 Matricaria chamomilla, 437
 May Apple Rhizome, 139
 Meconium, 613
 Mel, 638
 Melilot, 335
 Melilotus, 335
 Melilotus officinalis, 335

Mentha Piperita, 331
 Mentha spicata, 333
 Mentha Viridis, 333
 Menyanthes, 403
 Menyanthes trifoliata, 403
 Methysticum, 169
 Mexican Pepper, 467
 Mexican Sarsaparilla, 17
 Mezereum, 231
 Mineral Oil, 642
 Mint, 333
 Mombasa Pepper, 46
 Monkshood, 175
 Moschus, 644
 Moschus moschiferus, 644
 Mountain Balm, 387
 Mouth-root, 297
 Mucilage, 577
 Mullein Flowers, 419
 Mullein Leaves, 367
 Mullen Dock, 367
 Mullen Flowers, 419
 Musk, 644
 Musk Root, 171
 Mustard, 541, 543
 Mutton Suet, 641
 Myrica, 199
 Myrica cerifera, 199
 Myristica, 513
 Myristica fragrans, 513, 549
 Myrrh, 601
 Myrrha, 601

N

Nepeta Cataria, 345
 Night-blooming Cereus, 273
 Northern Pine, 253
 Northern Prickly Ash, 249

Nutgall, 575
 Nutmeg, 513
 Nux Vomica, 515

O

Odostemon Rafinesque, 105
 Oleoresins, 589
 Opium, 613
 Orange Root, 153
 Oregon Grape Root, 105
 Ordeal Bean, 535

Orris Root, 73, 75
 Ourouparia Gambir, 627
 Ovis aries, 641, 643
 Ox Bile, 639
 Osgall, 639

P

Palaquium Blanco, 617
 Pale Catechu, 627
 Pale Purple Cone Flower, 115
 Pancreatin, 644
 Papaver somniferum, 493
 Papaver somniferum album, 613
 Papaveris Fructus, 493
 Papoose Root, 133
 Paracoto, 217
 Paraffin, 640
 Paraffin Oil, 642

Paraffin Wax, 640
 Paraffinum, 640
 Pareira, 29
 Pareira Brava, 29
 Parsley Fruit, 481
 Parsley Root, 57
 Parsley Seed, 481
 Pasque Flower, 315
 Passiflora, 311
 Passiflora incarnata, 311
 Passion Flower, 311

Passion Vine, 311
 Paullinia Cupana, 545
 Pellitory Root, 49
 Pepo, 539
 Pepper, 451
 Peppermint, 331
 Pepper Wood, 247
 Pernambuco Jaborandi, 405
 Peru Balsam, 602
 Peruvian Krameria, 25
 Peruvian Rhatany, 25
 Persio, 561
 Petrolatum, 642
 Petrolatum Liquidum, 642
 Petrolatum Ointment, 642
 Petroleum Jelly, 642
 Petroselin Radix, 57
 Petroselinum, 481
 Petroselinum sativum, 57, 481
 Pheasant's Eye, 313
 Physter macrocephalus, 635
 Physostigma, 535
 Physostigma venenosum, 535
 Phytolacca, 33
 Phytolacca decandra, 33
 Picrasma excelsa, 259
 Pill-bearing Spurge, 295
 Pilocarpus, 405, 407
 Pilocarpus Jaborandi, 405
 Pilocarpus microphyllum, 407
 Pimenta, 453
 Pimenta officinalis, 453
 Pimpernel Root, 165
 Pimpinella, 165
 Pimpinella Anisum, 479
 Pimpinella magna, 165
 Pimpinella Saxifraga, 165
 Pine Tar, 606
 Pink Root, 155
 Pinus Alba, 253
 Pinus palustris, 591, 606, 609
 Pinus Strobus, 253
 Pipe Gamboge, 599
 Piper, 451
 Piper angustifolium, 369
 Piper Cubeba, 449
 Piper methysticum, 169

Piper nigrum, 451
 Pipsissewa, 379
 Pistacia Lentiscus, 595
 Pith, 257
 Pituitary Body, 641
 Pix Carbonis, 639
 Pix Liquida, 606
 Pix Lithanthracis, 639
 Plants, 281
 Pleurisy Root, 43
 Podophyllum, 139
 Podophyllum peltatum, 139
 Poison Berry, 279
 Poison Hemlock, 483
 Poke Root, 33
 Polygala Senega, 59
 Polyporus officinale, 563
 Pomegranate, 221
 Poppy Capsules, 493
 Poppy Fruits, 493
 Populi Gemmae, 359, 361
 Populus balsamifera, 359
 Populus nigra, 361
 Prairie Anemone, 319
 Prepared Lard, 643
 Prepared Suet, 641
 Prickly Ash, 247, 249
 Prickly Ash Berries, 495
 Prince's Pine, 379
 Prune, 443
 Prunum, 443
 Prunus Amygdalus dulcis, 537
 Prunus domestica, 443
 Prunus serotina, 241
 Prunus Virginiana, 241
 Pterocarpus Marsupium, 619
 Pterocarpus santalinus, 263
 Puke-weed, 343
 Pulsatilla, 315, 317, 319
 Pumpkin Seed, 539
 Punica Granatum, 221
 Purging Cassia, 489
 Purified Cotton, 571
 Purple Angelica, 125
 Pyrethrum, 49
 Pyrus Malus, 509

Q

Quaker Buttons, 515
 Quassia, 259
 Quebracho Bark, 209
 Queen's Delight, 35
 Queen's Root, 35

Quercus, 251
 Quercus alba, 251
 Quercus infectoria, 575
 Quillaja, 235
 Quillaja Saponaria, 235

R

Race Ginger, 83
 Raspberries, 505
 Red Cinchona, 213
 Red Clover Blossoms, 439
 Red Indigo, 561
 Red Pepper, 467
 Red Peruvian Bark, 213
 Red Puccoon, 149

Red Raspberries, 505
 Red Rose, 427
 Red Sandal Wood, 263
 Red Sarsaparilla, 21
 Red Saunders, 263
 Rennin, 645
 Renninum, 645
 Resin of Mastic, 595

Resina, 591
 Resins, 589
 Rhamnus Cathartica, 455
 Rhamnus Frangula, 223
 Rhamnus Purshiana, 243
 Rhatany, 25, 27
 Rheum, 167
 Rheum officinale, 167
 Rheum palmatum, 167
 Rheum tanguticum, 167
 Rhizomes, 65
 Rhizomes and Roots, 101
 Rhubarb, 167
 Rhus Glabra, 447
 Rio Ipecac, 47
 Roccella, 561
 Rock-rose, 299
 Roman Pyrethrum, 49
 Roots, 9

Rosa Gallica, 427
 Rosin, 591
 Round-leaved Sundew, 287
 Round Turkey Corn, 181
 Rubi Fructus, 503
 Rubi Idæi Fructus, 505
 Rubus, 207
 Rubus cuneifolius, 207
 Rubus Idæus, 505
 Rubus nigrobaccus, 207, 503
 Rubus strigosus, 505
 Rubus villosus, 207, 503
 Ruby Wood, 263
 Rumex, 37, 39
 Rumex Crispus, 37
 Running Moss, 569
 Russian Flies, 633
 Russian Glycyrrhiza, 111
 Rye Ergot, 565

S

Sabal, 445
 Saccharomyces cerevisiæ, 559
 Saffron, 429
 Saigon Cinnamon, 245
 Sambucus, 423
 Sambucus canadensis, 423
 Sambucus nigra, 423
 Sandal Wood, 261
 Sanguinaria, 149
 Sanguinaria canadensis, 149
 Santalum Album, 261
 Santalum Rubrum, 263
 Sarsaparilla, 17, 19, 21
 Sassafras, 205
 Sassafras Bark, 205
 Sassafras Medulla, 269
 Sassafras Pith, 269
 Sassafras variifolium, 205, 269
 Savanilla Krameria, 27
 Savanilla Rhatany, 27
 Saw Palmetto Berries, 445
 Scammoniz Radix, 31
 Scammony, 31
 Scarlet Sumac Fruit, 447
 Scilla, 179
 Scoparius, 275
 Scutellaria, 293
 Scutellaria lateriflora, 293
 Secale Cornutum, 565
 Seeds, 510
 Seneca Snakeroot, 59
 Senecio, 309
 Senecio aureus, 309
 Senega, 59
 Senega Snakeroot, 59
 Senna, 409, 411
 Serenoa serrulata, 445
 Serpentaria, 157, 159
 Seven-Barks, 109
 Sevum Præparatum, 641
 Short Buchu, 375
 Sierra Leone Pepper, 467
 Sinapis Alba, 543
 Sinapis Nigra, 541
 Skullcap, 293
 Slippery Elm, 287

Small-leaved Jaborandi, 407
 Small-leaved Pilocarpus, 407
 Smilax medica, 17
 Smilax Officialis, 19
 Smilax ornata, 21
 Smut of Rye, 565
 Smyrna Galls, 575
 Snake Moss, 569
 Soap-tree Bark, 235
 Socotrine Aloes, 621
 Soft-wood Charcoal, 269
 Solanum, 469
 Solanum carolinense, 469
 Solanum Dulcamara, 279
 Soldier's Cap, 183
 Southern Prickly Ash, 247
 Spanish Flies, 633
 Spanish Licorice, 113
 Spanish Saffron, 429
 Spearmint, 333
 Spermaceti, 635
 Spigelia, 155
 Spigelia marilandica, 155
 Spignet Root, 163
 Spikenard Root, 163
 Spores, 567
 Spruce Pine, 253
 Spurge Olive, 231
 Spurred Rye, 565
 Squaw Root, 133
 Squill, 179
 Squirrel Corn, 181
 Staggerweed, 523
 Staphisagria, 521
 Starch, 577, 579
 Star Grass, 151
 Stavesacre, 521
 Stems, 270, 304, 322
 St. Ignatius Bean, 517
 Stillingia, 35
 Stillingia sylvatica, 35
 Storax, 604
 Stramonium, 401
 Strophanthus, 529, 531
 Strophanthus Kombé, 529
 Strophanthus hispidus, 531

Strychnos Ignatii, 517
Strychnos Nux-vomica, 515
Styrax, 604
Styrax Benzoin, 611
Succus Citri, 508
Succus Pomorum, 509
Suet, 641
Sugar, 577
Sumac Berries, 447
Sumbul, 171
Sundew, 287, 289, 291

Suprarenal Glands, 640
Suprarenalum Siccum, 640
Surinam Quassia, 259
Sus scrofa domestica, 643, 644
Sweet Almond, 537
Sweet Bark, 233
Sweet Elder, 423
Sweet Orange Peel, 459
Sweet-scented Cactus, 273
Sweetwood Bark, 233
Swertia Chirayita, 285

T

Tamarind Pulp, 507
Tamarindus, 507
Tamarindus indica, 507
Tar, 606
Taraxacum, 121
Taraxacum officinale, 121
Terebinthina, 609
Terebinthina Laricis, 607
Texas Serpentaria, 157
Texas Snakeroot, 157
Thebaica, 613
Thorn Apple Leaves, 401
Thoroughwort, 347
Thuja, 277
Thuja occidentalis, 277
Thyme, 325
Thymus, 325
Thymus vulgaris, 325
Thyroids, 645
Thyroidum Siccum, 645
Tinnevely Senna, 409
Tolu Balsam, 603

Toluiifera Balsamum, 603
Toluiifera Pereira, 602
Tonquin Musk, 644
Tragacanth, 583
Tragacantha, 583
Trailing Mahonia, 105
Trifolium, 439
Trillium, 99
Trillium erectum, 99
Trifolium pratense, 439
Triticum, 145
True Unicorn Root, 151
Tuberous Roots, Bulbs and Corms, 172
Turkey Corn, 181
Turnera, 381
Turnera aphrodisiaca, 383
Turnera Diffusa, 381
Turpentine, 609
Tussilago Farfara, 399
Tussilago Leaves, 399

U

Ulmus, 237
Ulmus fulva, 237
Unicorn Root, 151

Urginea maritima, 179
Uva Ursi, 373

V

Valerian, 131
Valeriana, 131
Valeriana officinalis, 131
Vanilla, 491
Vanilla Bean, 491
Vanilla planifolia, 491
Vegetable Gelatin, 587
Velvet Dock, 367
Venice Turpentine, 607
Veratrum Viride, 129
Verbasci Flores, 419
Verbasci Folia, 367

Verbascum phlomoides, 419
Verbascum thapsiforme, 419
Verbascum Thapsus, 367
Verbena, 307
Verbena hastata, 307
Verona Orris Root, 75
Veronica virginica, 135
Viburnum Catago, 227
Viburnum Opulus, 229
Viburnum Prunifolium, 227
Virginia Serpentaria, 159
Virginia Snakeroot, 159

W

Wahoo Bark, 197
Wake-Robin, 99
Wax Myrtle, 199
White Garlic, 563

White Ash Bark, 239
White Cedar, 277
White Cinnamon, 225
White Mallow, 397

White Mallow Root, 41
 White Mustard, 543
 White Oak Bark, 251
 White Pine Bark, 253
 White Sandal Wood, 261
 White Walnut Bark, 203
 Wild Bryony, 63
 Wild Chamomile, 437
 Wild Cherry Bark, 241
 Wild Cinnamon, 225
 Wild Geranium, 77
 Wild Ginger, 141

Wild Hydrangea, 109
 Wild Indigo, 23
 Wild Yam Root, 69
 Willow Poplar Buds, 361
 Wind Flower, 315
 Witch Hazel Leaves, 391
 Wolf Grape, 279
 Wood Charcoal, 269
 Woods, 257
 Wool Fat, 643
 Woody Nightshade, 279
 Wormwood, 351

X

Xanthoxyli Fructus, 495
 Xanthoxylum, 247, 249
 Xanthoxylum americanum, 249,
 495

Xanthoxylum Clava-Herculis, 247,
 495

Y

Yam Root, 69
 Yeast, Compressed, 559
 Yellow Cinchona, 211
 Yellow Dock Root, 39
 Yellow Gentian Root, 119
 Yellow Jasmine Root, 107
 Yellow Lady Slipper Root, 147
 Yellow Melilot, 335

Yellow Mustard, 543
 Yellow Peruvian Bark, 211
 Yellow Pine Rosin, 591
 Yellow Sandal Wood, 261
 Yellow Sweet Clover, 335
 Yellow Wax, 637
 Yerba Santa, 387

Z

Zea, 431
 Zea Mays, 431, 579
 Zedoaria, 93
 Zedoary Root, 93

Zingiber, 79, 81, 83, 85, 87, 89
 Zingiber officinale, 79, 81, 83, 85,
 87, 89

APR 7 1919



SUPERIOR BOTANICALS

ALL the botanical and other crude drugs used in the Squibb Laboratories are obtained from the best known sources and only those of first quality are employed. Shipments are accepted by us only after they have been examined and passed by our expert pharmacognosists, and by our Control Laboratories where they are tested chemically; and in many instances they are subjected to additional tests by our Physiological Laboratories.

Each drug is first examined macroscopically and microscopically, to establish its identity. Then it is thoroughly garbled to remove any foreign drugs or parts of the plant which may have been included in the harvesting and which are not included by the official definition. For example: if the bark of the root is the part which the Pharmacopœia directs to be used, we exclude all bark of the stem and all undue quantities of woody material. Likewise, when leaves are officially specified, stems, etc., must not be present.

Also inspection must show plainly that the drug, after collecting, was promptly and carefully dried and kept in a clean place; and there must be no evidence of fermentation or of dirt accumulated during the drying. Fermentation caused by packing drugs before they are perfectly dry is one of the chief causes of change in the active principles.

Drugs for which the Pharmacopœia prescribes a definite alkaloidal strength, are assayed carefully to make sure they are at least of that strength; and in those instances where biological assays are officially required or recommended, the drugs are subjected to the proper tests at our Physiological Laboratories. Furthermore, we also physiologically test and standardize our ergot preparations, as well as a number of other potent drugs for which there is no chemical assay established, but which can be tested biologically.

In consequence of this care, the botanical drugs sold by E. R. Squibb & Sons or elaborated into the various Squibb official preparations, are of the highest quality, hence therapeutically active and dependable.

DEPENDABLE ERGOT PRODUCTS

THE house of E. R. Squibb & Sons has for a long time been recognized as the first producer of ergot preparations of exceptional quality and absolute reliability. What Dr. Stearns was to the introductory therapy of ergot, Dr. Squibb was to its pharmacy; he studied it, experimented with it unceasingly, and established the name "Squibb's Ergot" firmly in medicine.

Medicinal ergot is a poisonous, parasitic fungus growing on rye. Its value depends very largely upon cautious selection, thorough cleansing, careful preservation, correct manipulation until all its essential principles are extracted, and proper packing of the finished product. *Spanish* rye ergot is far superior to all other kinds, as the peculiar atmospheric conditions of the Spanish peninsula favor a more mature and otherwise better growth of the fungus. Squibb's Ergot preparations are made from this Spanish rye ergot exclusively. Each year a fresh lot is secured, and upon receipt of an importation it is subjected to a very thorough process of cleansing by which all extraneous and inert matter is removed. Then as soon as practicable this clean ergot is ground and immediately extracted by the Squibb reperloration process, and made up into those preparations which are recognized as safe and efficient for administration.

Finally, Squibb's Ergot preparations are carefully tested physiologically according to the method recommended by Drs. Edmunds and Hale (Hygienic Lab. Bull. No. 76), and admirably conform to their standards. Particular mention may be made of Squibb's *Sterile Ergot*, an alcohol-free preparation for hypodermic or intramuscular injection, physiologically standardized so that each mil (Cc.) represents 2 Gm. of best Spanish Ergot.

Consequently, the use of Squibb's Ergot in any of its forms is in no sense a matter of clinical experiment, so often attended with serious risk, but the application of a proven remedial agent carefully prepared, tested and standardized.